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BetterFit

A Conceptual Solution for Seamless Exercise Experience

By **Hongwei Huang**

A Thesis Submitted in Partial Fulfillment of the
Requirements for the Degree of Master of Fine Arts
in Visual Communication Design

School of Design
College of Imaging Arts and Sciences
Rochester Institute of Technology
Rochester, NY

December, 2017

Thesis Approvals

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Abstract

The development of fitness technology has changed the way we exercise over time, and each technology has allowed people to exercise independently in various ways, such as wearable devices, fitness apps, game consoles, and even social media. The consequence is that more people get used to exercising solely with their digital device and get motivated from virtual communities rather than in a real environment. However, the research shows there can be even more benefit for people by exercising with others in a physical space.

The thesis utilizes UX design methodologies to develop a seamless-workout experience that enables a user to easily attend a group-exercise program in a health-club-based environment, targeting beginners to experienced enthusiasts and encouraging them to exercise in a group. This project investigated a number of exercise technologies and methodologies that involved user surveys and observations. The proposed solutions are integrated user-experience design methods, user-interface design, interaction design, motion design, and prototype design. The final deliverables of the project are an interactive prototype and a series of motion prototypes. The purpose of the motion prototypes is to present how a fluid motion design can enhance user experience.

Keywords

User-experience design, user-interface design, exercise, interaction design, motion design, prototyping, iOS, gym, health club, high-intensity interval training, iPad, UX choreography

01

Introduction

Situation Analysis

People benefit more and more from exercise-related technological inventions allowing them to start exercising much easier than ever today. For example, we can exercise at home anytime with our game consoles. Also, there are numerous fitness apps that let us get inspired from online communities, and many people like to have a wearable device to track their exercise data every day for better performance. Thus, people are becoming more comfortable with exercising alone with their digital devices. However, there can be more benefit from exercising together as a group, rather than working out individually.

Compared to exercising alone, using a digital product in a group-exercise program provides even more advantages. It enables you to start exercising without taking risks in getting injured, which is very helpful and important, particularly for beginners. In addition, with a long-term-exercise plan, provided by a professional, group exercise helps you save time, especially for those who have hectic schedules.

Furthermore, group exercise is accessible to almost everyone. People can find a group-exercise provider not only in a boutique health club but also in a public-activities center. For instance, RIT's Gordon Field House and Activities Center offers students quality group classes for a low cost. Therefore, this university's activities center has been chosen as an example to implement this conceptual experience design project to accommodate a large audience size.

Problem Statement

According to the survey conducted by Normal Bar Interactive, the top reason for not exercising is “not enough time.”¹ Fortunately enough, current technology gives interaction designers the opportunity to make a quality product for users to exercise more effectively by making it easier to build an exercise plan offering more efficient communication methods between people.

It often takes a beginner a period of time to build a safe and effective exercise plan. However, if they get the chance to observe and ask experienced exercisers, it can be incredibly helpful for them to understand more quickly the fundamental knowledge of exercise, therefore, reducing the time spent for finding and utilizing professional resources. The experienced exerciser can also solidify their own knowledge by teaching others.

This thesis project proposes a solution that will address the following challenging questions:

- How to motivate a person to start a group exercising program?
- How to use current technologies to digitalize a health-club environment to simplify an exercise flow?
- How to encourage people at different levels to help each other improve their performance together?

¹ Chrisanna Northrup. “‘Not Enough Time To Exercise’ Is Just An Excuse”. HUFFPOST, August 15, 2011. Accessed December 12, 2017. https://www.huffingtonpost.com/chrisanna-northrup/exercise-excuse-internet_b_927097.html.

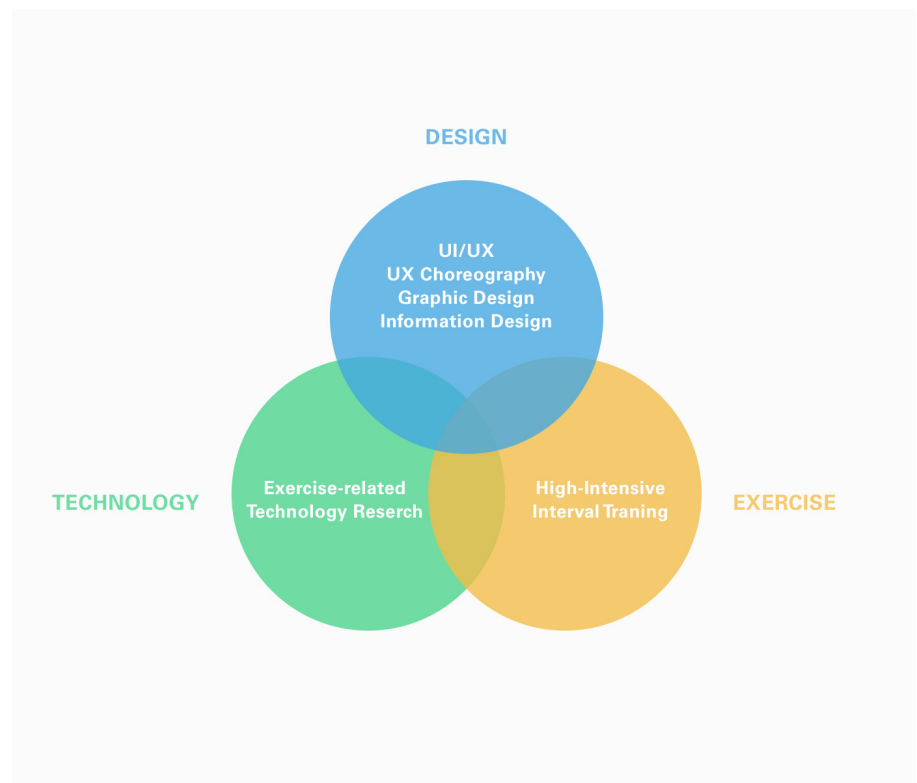
02

Research Considerations

Research Considerations

Since the thesis project aims to integrate UX and interactive design with current technology to develop a seamless exercise experience, the research will focus on three parts: design, technology, and exercise. The diagram illustrates specific directions on each component (Figure 1).

Figure 1.
Research Diagram



Research on Exercising

To research further about exercise, I took two exercise courses to experience how group exercise works. One was the Cardio, Strength & Core class at RIT, in which there was a professional instructor and a lot of students. In the other course, Personal Training, I had a one-on-one training session with a professional trainer for approximately an hour each session.

After taking the two courses, the findings include the following:

- Following an experienced trainer helps save time in planning a workout schedule
- Preparing equipment takes the greatest amount of time for a group exercise such as high-intensity interval training (HIIT)
- Observing a professional's posture is the best way to learn a good quality exercise
- Exercising with a friend in the same group can increase motivation for each other to keep persistently exercising
- A free-style fitness room is the best place for conducting a multi-purpose exercise such as HIIT, yoga, stretching, and so forth
- HIIT is a relatively very modern technique to reach the best exercise results within a minimum amount of time
- The process of HIIT planning is relatively complicated, compared to other methods

Research on Exercising

Based on these findings, I settled on an HIIT session in a free-style fitness room as an example to implement my thesis project because its planning is complicated, giving me the greatest opportunity to demonstrate how user-experience design can simplify a complex process and benefit a user's time and efforts.

Research on Exercising

High-Intensity Interval Training (HIIT)

Since this became the main subject to implement the project, it was necessary to research HIIT in depth. The Tabata training, one of the training systems of HIIT, was the most popular form found during the research. The main objective of the Tabata training is to build strength and improve cardio conditions within a short amount of time. There is a typical process to achieve the goals. First, a trainer works intensively at maximum capacity for 20 seconds, followed by a 10-second rest. After recovery, the trainer starts with low-stress movement, getting ready for the next intensive workout with controlled breathing, and finally repeats the cycle.

Research on Technology

Reactive LED Display

The initial assumption about the main reason for people not to exercise was fear to get an injury; thus, developing a digital interactive workout environment to reduce the risk of injury was the main focus for the technology research. It was discovered that a reactive LED floor with built-in motion sensors might be the best solution. The reason is the reactive LED technology allows a display of motion movement graphics in any surface to guide a user to perform appropriate postures. Also, it can display user's exercise plans and performance data.

However, the result of the survey questions (Figure 2), conducted to validate the initial assumption, revealed that the main reason for not going to exercise was not having enough time, rather than fear of injury. Thus, I have decided to have the LED technology only for displaying information as a part of my thesis concept.

Figure 2.

The first question shows the top reason of not going to gym among survey participators

Visual Communication Design Thesis Project. Survey May, 2017

BetterFit: A digital visualization concept of the future gym experience
Hongwei Huang

1 What are the reasons for NOT going to the gym / school activities center / health club?
☒ Time ☐ Fear(get injured) ☐ No Partners ☐ Fresh Start ☐ Others _____

2 How helpful do you think a group exercise (Yoga/HIIT class, Partners, etc.) to keep being motivated?
 1 2 3 4 5
 Not at all helpful Not so helpful Somewhat helpful Very helpful Extremely helpful

3 How likely are you to exercise with friends?
 1 2 3 4 5
 Not at all Not so much Somewhat like Very like Extremely like

4 How much are you interested in exercising in a gym with newer technology? (Projection, motion tracking, etc.)
 1 2 3 4 5
 Not at all Not so much Somewhat like Very like Extremely like

5 What smart device do you have for exercise?
☐ Watch ☐ Band ☒ Smart Phone ☒ Xbox ☐ Others _____

Survey of Literature

Design

Lean UX: Applying Lean Principles to Improve User Experience

Gothelf, Jeff, Josh Seiden, and EBSCO Publishing (Firm). 2013

A comprehensive introduction of Lean UX approach to interaction design providing specific methodology to help rapidly experiment product ideas by writing hypotheses, encouraging designers to validate ideas with potential users, and polish designs with the feedback you get from users to develop a better experience for a successful product. This book is extremely helpful in the idea validation of this thesis.

Don't Make Me Think: A Common Sense Approach to Web Usability

Krug, Steve. Indianapolis, Ind: New Riders Pub, 2000.

This is a fundamental guidebook for beginners of website design. The author illustrates principles of good website design through clear content. The methodology of usability testing is the most valuable part of this book. A well-prepared usability test can help a designer improve their design in an effective way. Also, usability testing can benefit a company in budgeting because it can predict the future errors of a new project. Moreover, this book includes many screenshots of examples to help readers understand the content.

Survey of Literature

Design

Mobile Usability

Nielsen, Jakob, and Raluca Budiu. Berkeley, CA: New Riders. 2013

It is an excellent book that introduces interaction and user experience design based on empirical research. This book provides insight of how to understand the users' needs for both designers and developers. The numerous examples of website design for mobile devices illustrate the importance of simplicity in mobile user-experience design.

Designing Interface

Tidwell, Jenifer. Sebastopol, CA: O'Reilly. 2006

This book provides a lot of examples of user interface design by categories. The examples include mobile application, website, and desktop software, which make it a super handful reference book for inspiration of interface design solutions.

Type on Screen

Lupton, Ellen, and Noel Cunningham. New York: Princeton Architectural Press. 2014

This book shows numerous benefits for designers who work with typography on screen, which can be a perfect guide for designers in selecting a good screen typeface. The integration of historic background and theories of type on screen provides a special insight in helping designers understand screen-based type.

Survey of Literature

Design

Infographic Designers' Sketchbooks

Heller, Steven, and Rick Landers. New York, NY: Princeton Architectural Press. 2014

This book is an inspiring book for infographic design. The various examples that were collected from famous designers' works with sketches and ideas are helpful for this thesis project. It is also a great resource to understand information architecture.

Sketching User Experiences: The Workbook

Greenberg, Saul and Inc Books24x7. 1st ed. Amsterdam;Waltham, Mass;Boston,; Elsevier, 2012;2011,.

This book provides different sketching techniques that were used by UX designers. This is a very practical book because it describes the reason to do sketching alongside the illustrated tutorials. The narrative storyboard method presented in the book helped to find out key experiences for potential audiences for this thesis.

Survey of Literature

UX Choreography

The Principles of UX Choreography

Rebecca Ussai Henderson. <https://medium.freecodecamp.org/the-principles-of-ux-choreography-69c91c2cbc2a>

The author Rebecca Ussai Henderson, who is a principal UX designer, explains how the Disney animation principles influences digital product design nowadays. This article introduces a new field to me, encourages me to explore and learn more about UX Choreography and animation.

Creating Motion Graphics with After Effects: Essential and Advanced Techniques

Chris Meyer; Trish Meyer. Focal Press; 5 edition. 2010

This is the best resource for learning After Effects, the software I executed most of my thesis design works. It covers almost every functionality inside After Effects.

Storyboard Design Course: Principles, Practice, and Techniques

Giuseppe Cristiano. Barron's Educational Series. 2007

The author presents the fundamental methodologies of storyboarding for people who want to explore designing storyboards. It is especially helpful since the contents are well-organized and sectioned by different courses.

Survey of Literature

Exercise

Tabata Workout Handbook: Achieve Maximum Fitness With Over 100 High Intensity Interval Training Workout Plans

Roger Hall. Hatherleigh Press. 1 edition. 2015

This book covers variety of exercise plans based on the Tabata's study. Tabata's HIIT workout theory is one of the popular forms for HIIT training, it was originally applied in Japan's Olympic speedskating training team.

Strength Training Anatomy

Delavier, Frédéric. 3rd ed. Champaign, IL: Human Kinetics. 2010

Delavier's work is an anatomy book that talks about exercising and muscle involvement. By understanding the connection between muscles and exercising postures, trainers can build spiritual recognition while exercising to improve their performance. Also, as injury prevention and recovery are related to muscle movements, a deep understanding of muscle anatomy is needed to avoid gym injuries.

Five Most Common Gym Injuries

Levin-Epstein, A., (n.d.) Five Most Common Gym Injuries. Retrieved from <http://www.mensfitness.com/training/five-most-common-gym-injuries>

This report talks about the most common gym injuries and its solutions. Also, this report cautions about the rising number of gym injuries that should be paid attention to by exercisers.

Survey of Literature

Exercise

The Future of Gyms

Sawyers, P., (2013, Oct.19). The Future of Gyms. Retrieved from <https://thenextweb.com/insider/2013/10/19/the-future-of-gyms/#gref>

This article shares some interesting statistics of gym-related business. These statistics indicate that gym business has developed rapidly through years. The article also talks about the newer gym technologies, and how these technologies can benefit their members

Benefits of Group Exercise

Dolan, S., (2016, Oct. 7). Benefits of Group Exercise. Retrieved from <http://www.acsm.org/public-information/articles/2016/10/07/benefits-of-group-exercise>

Shawn Dolan, Ph.D discusses the benefits of group exercise and the reasons why people quit exercise programs.

03

Design Process

Design Concept

The goal of this thesis is to encourage people to participate in a group exercise program by integrating current technologies with UX and interactive design principles. The main focus is to develop an interactive iOS application that is connected to an LED built-in exercise environment, which allows users to exercise together effectively and happily (Figure 3). Since the LED technology for displaying information in a space has already been implemented for years, more emphasis was given on prototyping the interactive iPad app. UX choreography plays an important role in this thesis because it adds value in simplifying a complex exercise planning process by having intuitive and fluid motion strategies.



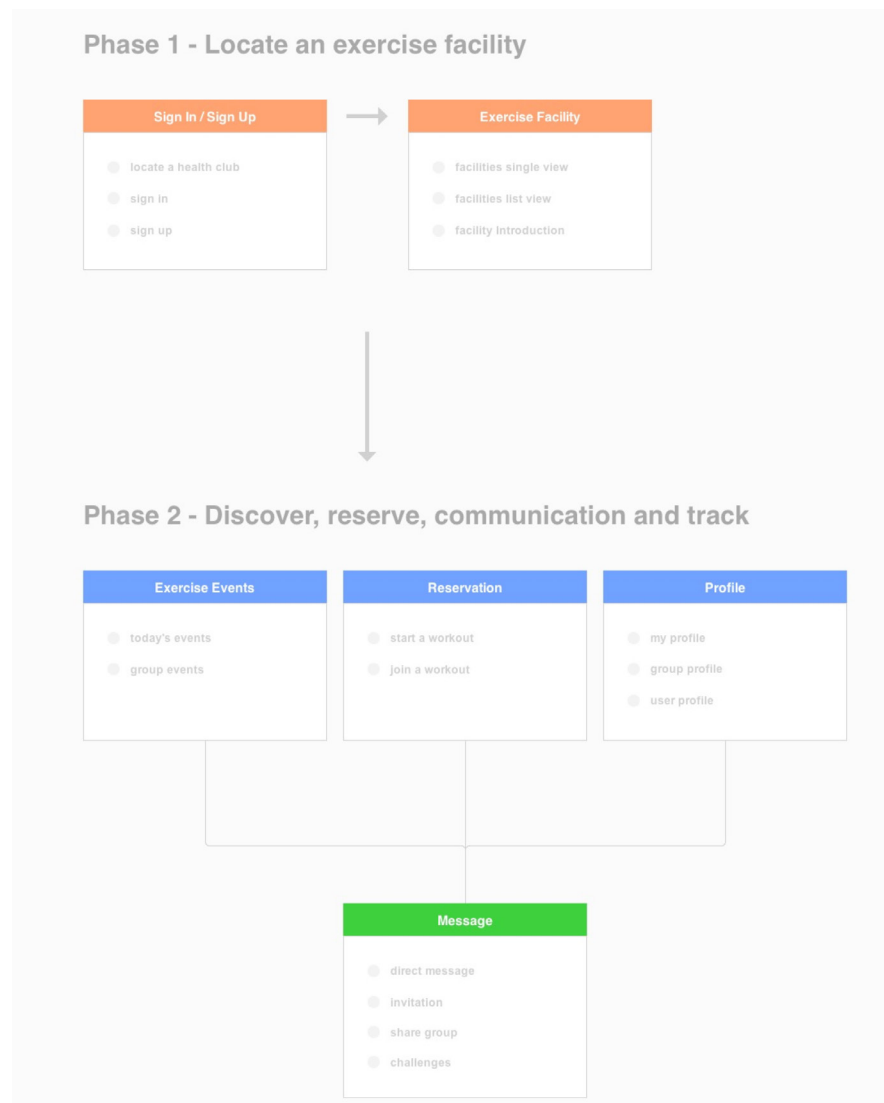
Figure 3.

A sketch of illustrating methodologies and goals

Sitemap

The sitemap describes the information architecture of this thesis project (Figure 4). In the first phase, it requires a user to select a place to start their exercise. A sign-in or sign-up process is necessary to access a membership-based health club. The second phase is designed to let users discover group exercises, track their exercise data and histories, plan an exercise schedule, and communicate with other users.

Figure 4.
The sitemap



Target Audience, Primary

Vini Brown

Graduate Student

Quotes

"Work hard, stay focused."

Demographics

Age: 24 years old

Gender: Male

Education: Master's Degree

Country of Residence: The United States

Location: Rochester, New York

Personality

Personality traits: Wise, friendly, active and trustworthy

Archetype

Vini is a graduate student at RIT, majoring in Industrial Design. He spends most of his time in his lab where he sits for a long time each day. He recently started to feel overall muscle pain in his back. Some of his classmates recommended for him to go workout at the RIT gym, but he had no idea about what exercises would help his pain. Also, he did not have much experience working out as well as the fact that he felt it would take too much time for him to go to the gym.

Needs & Solutions

- An easy-to-understand guide on how to start an exercise
- A community where he can learn from experienced exercisers
- An effective way to keep motivated to exercise

Target Audience, Secondary

Banny Lindo

Fiction Writer/ Creative Writer

Quotes

“The key for a successful life is not only achieving career success but also staying healthy.”

Demographics

Age: 35 years old

Gender: Male

Education: Bachelor’s Degree

Country of Residence: The United States

Location: New York City, NY

Personality

Personality traits: Energetic and outgoing

Archetype

As a freelancer, managing his time efficiently is the key to the balance between his work and life. He takes advantage of having a flexible time schedule to pursue his favorite hobby: exercising. Banny loves to explore the field of exercising, since he feels exercise makes him happy, and he is able to be more focused on his work. He joined in a writers’ exercising club in New York for exchanging exercise experiences. He likes to share his workout experience with new members because teaching others is the best way for him to solidify his knowledge in exercise. He is also passionate about technology, as an early adopter—believing technology can increase a quality of life.

Needs & Solutions

- A self-evaluation system for better exercise performances
- A well-designed time management tool for planning exercise
- A community communication tool by which he can share more experiences

Target Audience, Tertiary

Joyce Chen

Professional Trainer

Quotes

"It is important for everyone to have the ability to maintain a healthy life. Adding fun to exercise is my mission to keep my students motivated and healthy; therefore, they enjoy their lives better and are healthier."

Demographics

Age: 35 years old

Gender: Female

Education: Bachelor's Degree

Country of Residence: The United States

Location: New York City, NY

Personality

Personality traits: Down-to-earth, cheerful, and bright

Archetype

Joyce is a trainer who is specialized in yoga and HIIT training. She keeps her professional knowledge up-to-date because she is enthusiastic about her profession. She never hesitates to implement new ways of training in her classes and is open to hearing feedback from students. Her profession makes her an incredible trainer so her students consider her a friend as well. Besides training, she enjoys cooking for her family. She likes spending time with her family during the weekends. Sometimes she goes camping with them or has a meal together at one of the family members' home.

Needs & Solutions

- A tool for planning exercise schedules for an exercise group
- An effective communication tool for an exercise group

Competitive Analysis

The marketing research methodology for strength, weaknesses, opportunities, and threats (SWOT) helped me to better understand the marketing needs in the field of exercise: what were the opportunities, what to avoid, and how to differentiate the product from other existing products

Les Mills International

Highlight: Immersive fitness experience, wraparound projectors and LED technology

Strengths

- Sophisticated industry leader, a large number of customers
- Great integration with technology, especially with their immersive spinning class with augmented reality (AR) technology
- Appealing and futuristic-looking visual design

Weaknesses

- The visual and motion design language is not intuitive, making it difficult to follow the guide
- The AR experience can be distracting
- Lacks the interaction between a user and the projection of movement guides
- No personal data tracking during a training session

Opportunities

- Provides a user with data-tracking function
- Adds more interactions between users and technology
- Extends services, even outside the gym
- Builds a social networking system among users for exchanging exercise inspirations

Threats

- Immersive AR experience is not suitable to everyone; some people might have negative reactions such as dizziness while interacting with AR

Pavigym Fitness Tile

Highlight: Interactive wall and floor solutions with sensors and lights, gym flooring and lighting integration

Strengths

- Comprehensive integration with gym environment, from software to hardware
- The flooring solution is very flexible to fit any gym floor plan
- Well-designed visual language to help users focus on their exercise
- Data tracking provided, building an exercise plan is easy

Weaknesses

- Need learning curve for getting started
- Challenging experience is not engaging enough
- Lacking performance feedback whilst exercising

Opportunities

- Design language can be improved for better exercise guiding experience
- Add newer technologies to develop more immersive experience, such as LED display technology for performance data display
- Make exercise planning system better to attract people with hectic schedules to return to exercise

Threats

- N/A

Polar Club

Highlight: Heart-rate-based group-fitness app, activity tracker

Strengths

- Active online community
- The entire exercise experience is not only available while exercising but also when not exercising.
- A seamless service powered by deep digital integration, including website, app, hardware, data-analysis system, event tracking system, etc.
- Breaks the communication restriction between exercisers and professions
- The Polar Flow product is incredibly valuable in gathering people who share mutual interests together, and the data-tracking system is well-designed for keeping an eye on their exercises as well as understanding their improvements

Weaknesses

- Relies heavily on professionals for understanding data
- Information architecture of the web and app are not clear enough in terms of usability
- Graphic design could be improved to adapt to current design trends
- More focus on spinning or cycling rather than other exercise forms

Opportunities

- Expanding the service to other exercise forms
- Provide more immersive exercise options

Threats

- Additional cost is required to unlock more features and services

Visual Design

The visual identity of BetterFit tries to convey a visual language of “high-technology,” “synergy,” and “energy.” In order to illustrate the visual concepts, the elements of the visual design include vector graphics, clean-and sharp-looking icons, colors that feel energetic, and cutting-edge technology.

Logo & App Icon

A flash of lightning is a metaphor representing the three abstract concepts that the visual identity appropriates. The letter “F” from “Fit” transforms into a flash of lightning-like shape. For the typeface, Lato is used to illustrate the concepts. It is a stable-looking sans-serif typeface, which helps to associate strong energies from exercises. Moreover, it has a bit of roundness in its details, so it reminds us of flexibility, familiarity, and humans’ organic body movements.

Figure 5.
The logotype and app
icon design

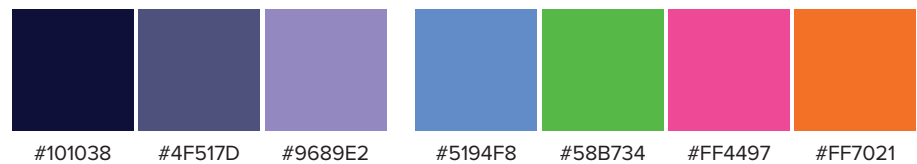
BETTER FIT



Colors & Typography

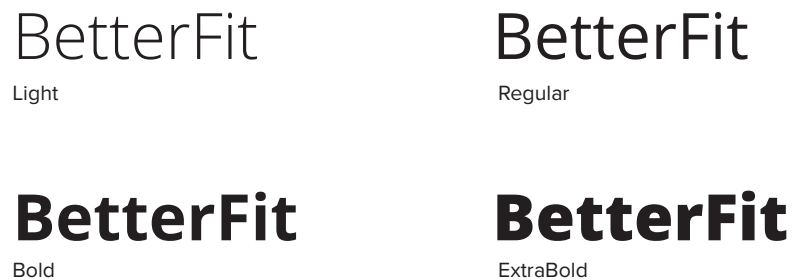
To deliver the feeling of the cutting-edge technology integrated with humanization, as it encourages group exercise, a deep marine blue color is used as the primary. For accent colors, lively and bright colors are chosen: pink, orange, red, and green.

Figure 6.
Color palette with Hex code



Open Sans is a sans-serif type family that is one of the best typefaces to use for clean looking UI. Its bit of roundness also matches well to the logo, so the visual identity is consistent in its entirety. Below the figure describes what typefaces are used in the product.

Figure 7.
Open Sans

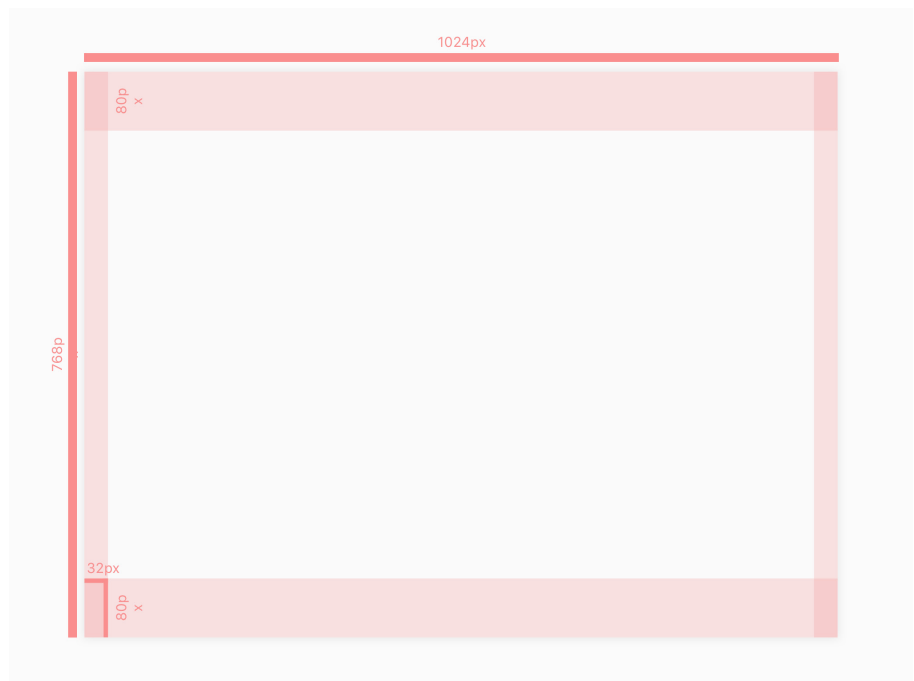


App Layout & Grids

This project used 8px grid system as guidance. The iPad app uses a 1024 wide 768px screen with margins of 80px on the top and bottom and 32px on the left and right, followed by the 8px grid rule to keep design consistency. All content is contained in a safe zone for readability purposes. The button-style design is also based on the 8px grid rule.

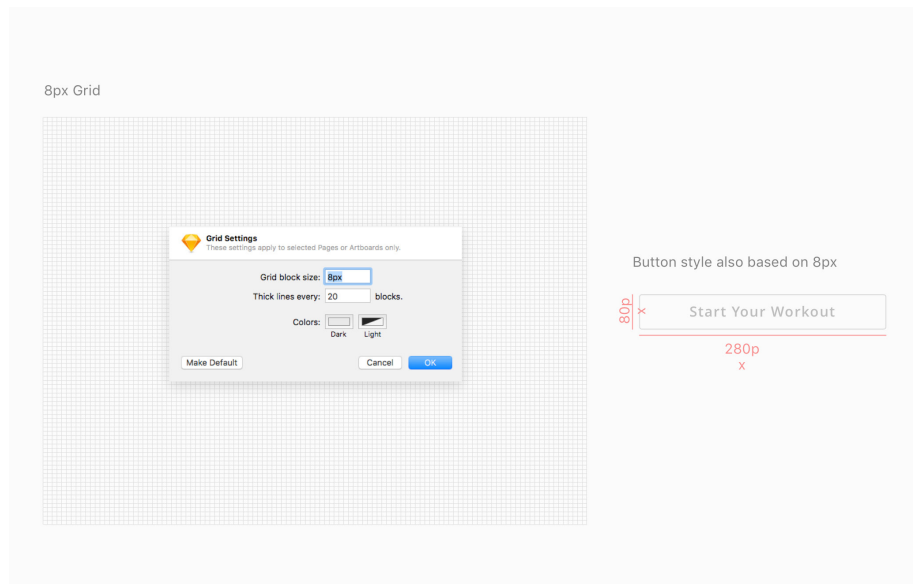
Figure 8.

The layout design of BetterFit iPad app



App Layout & Grids

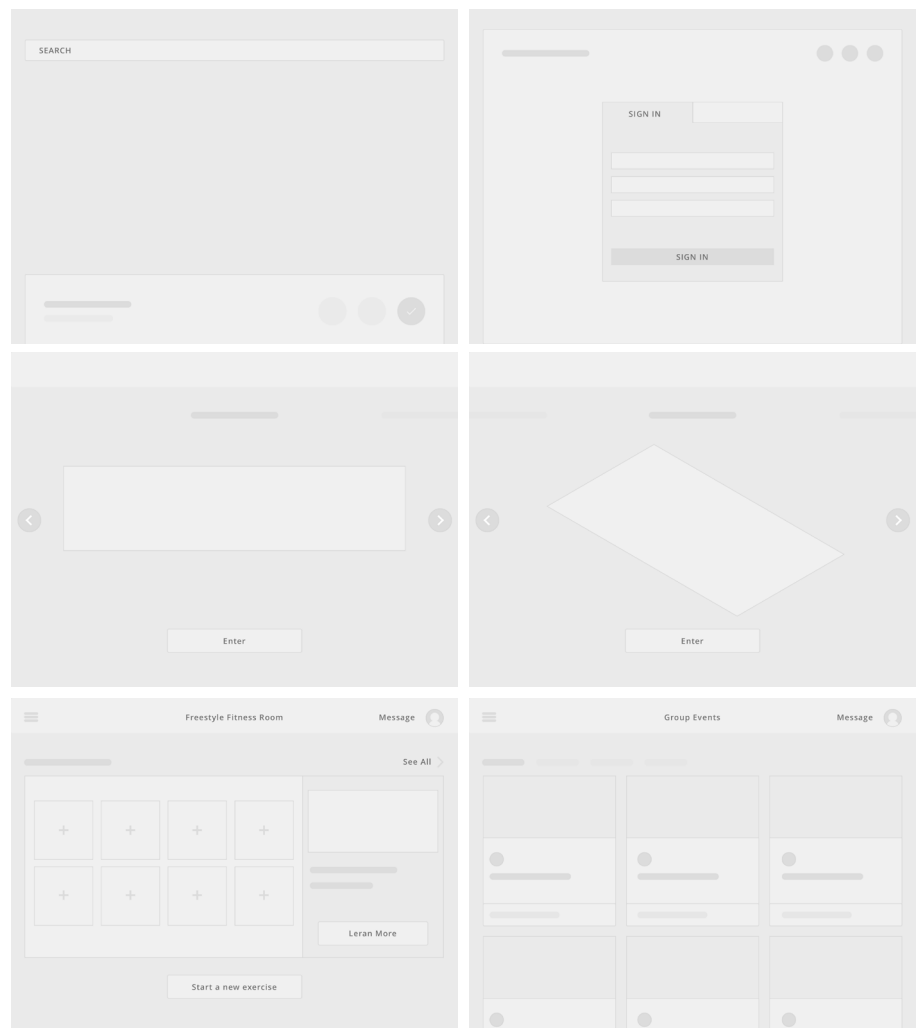
Figure 9.
The grid system



Wireframe

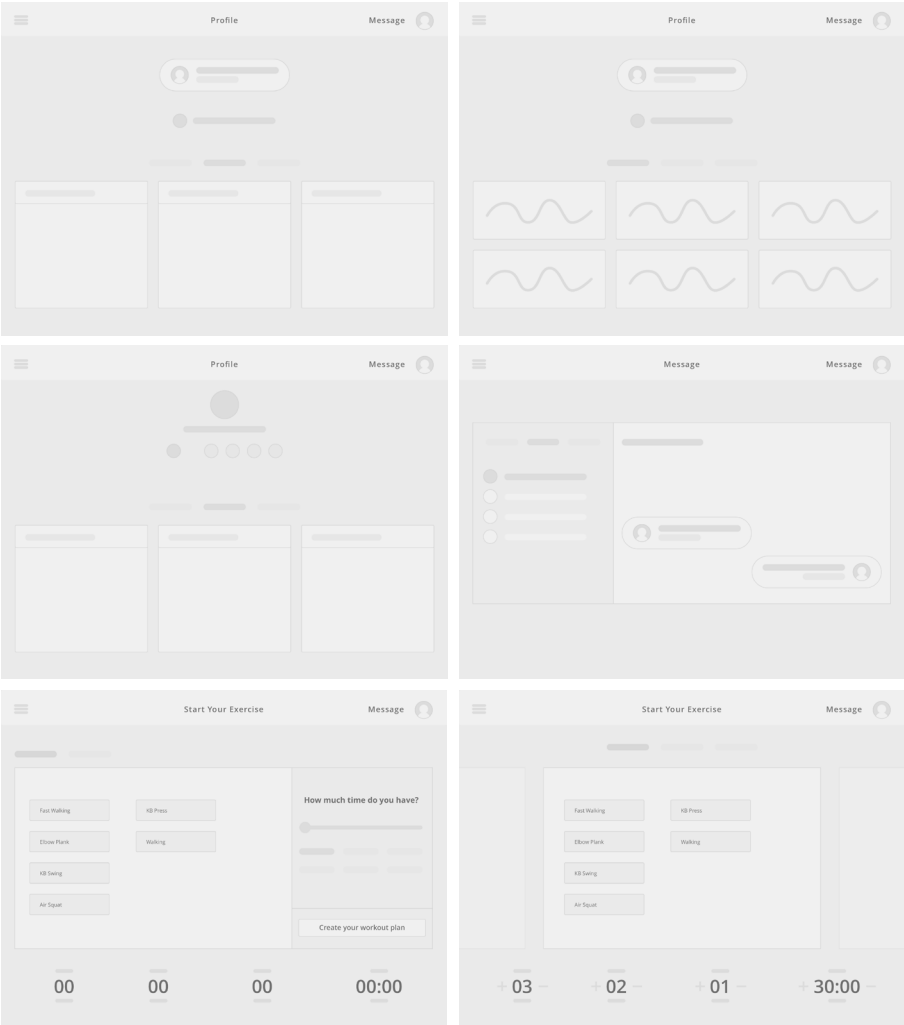
Before diving into the final interface design, a version of low-fidelity prototype was designed to help envision the potential layout.

Figure 10.
Low-fidelity prototype



Wireframe

Figure 11.
Low-fidelity prototype



04

Final Applications

Final Applications

The BetterFit app is structured with five main parts: Locate a Facility, Start Your Workout, Group Event, My Profile, and Messenger. These key components serve as a counterpart for each other to build a seamless exercise experience.

The primary design tool to implement the product is the Sketch app. InVision Studio was used to create the interactive prototype, and Adobe After Effects was the tool used to design the motion prototype.



Figure 12.
Splash screen with logotype

User Interface Design

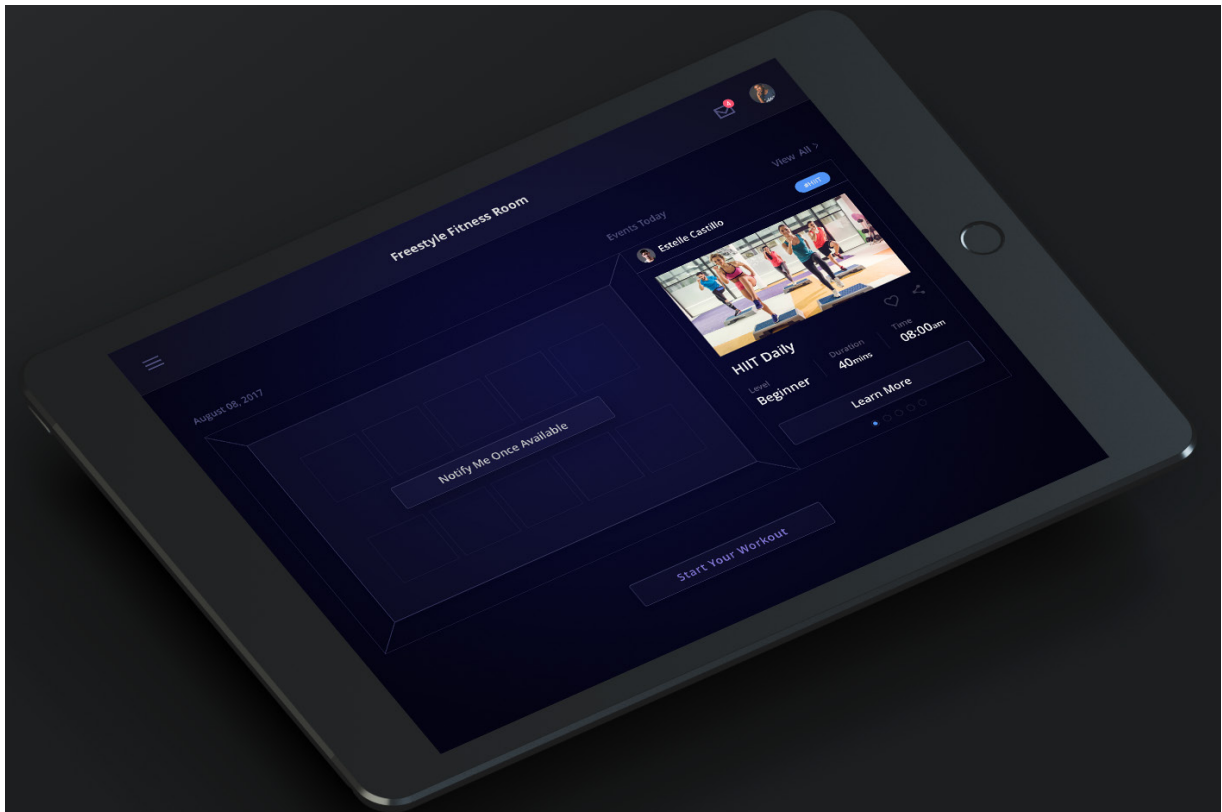


Figure 13.
Home screen of a freestyle
fitness room

User Interface Design



Figure 14.
HIIT workout planner

First Experience

After the splash screen, a user can search for a health club that uses the BetterFit app (Figure 15). Logging-in or signing-up is required (Figure 16).

Once choosing a health club(s) he is interested in, the user can browse types of exercise facilities offered by the health club. Clicking on Enter will lead to the introduction page of the facility. In this thesis project, a freestyle fitness room is used as an example.

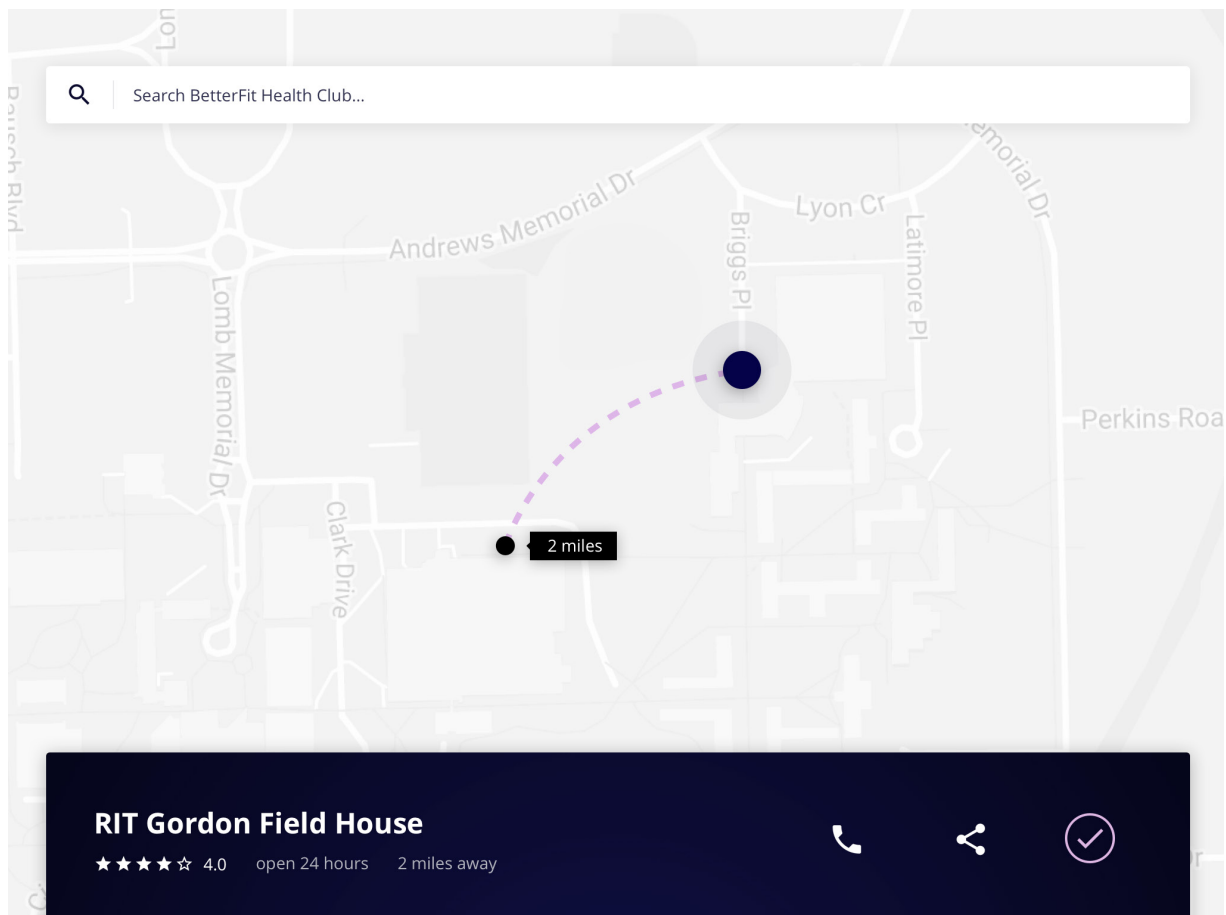


Figure 15.

Map view screen. The information panel slides up when tapping on a location

First Experience

Figure 16.
Sign-in and sign-up screen

The figure displays two screenshots of the BetterFit application's authentication interface, which is overlaid on a map of the RIT Gordon Field House area. The interface has a dark blue background with white text and icons.

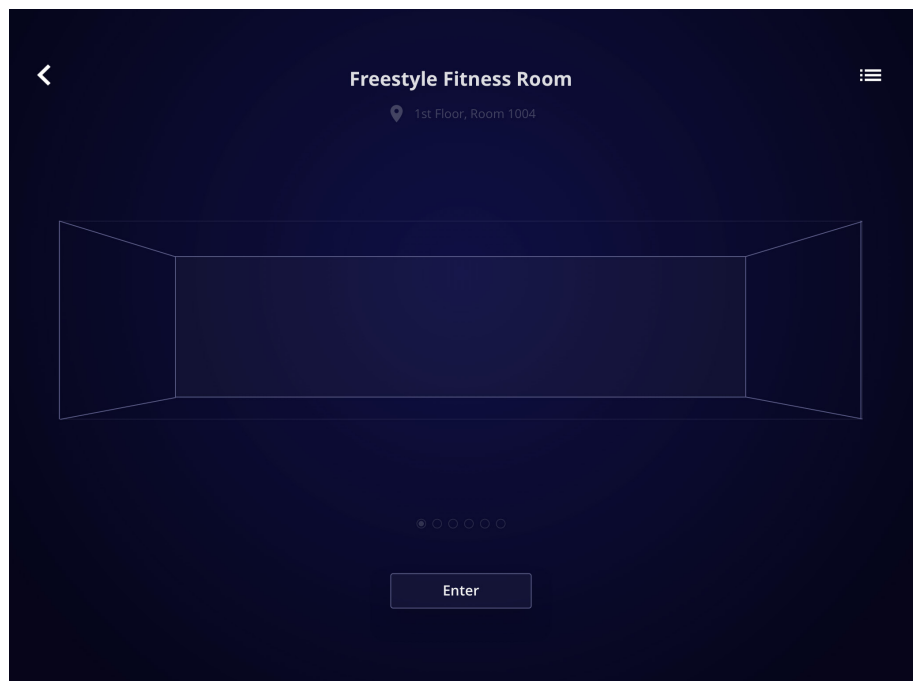
Top Screenshot (Sign In): This screen shows the 'Sign In' tab selected. It features input fields for 'Email or Member ID' and 'Password', followed by a 'Sign In' button. Below the button, there is a link 'or sign in with...' and social media icons for Twitter, Google, and Facebook. The 'BETTER FIT' logo is at the bottom.

Bottom Screenshot (Sign Up): This screen shows the 'Sign Up' tab selected. It features input fields for 'Email or Member ID' (containing 'hwinuse@gmail.com'), 'Password', and 'Confirm Password' (both containing '*****'). Each field has a checkmark icon on the right, indicating successful validation. Below the fields is a 'Sign Up' button. The same 'or sign in with...' link and social media icons are present at the bottom, along with the 'BETTER FIT' logo.

Facility Home Page

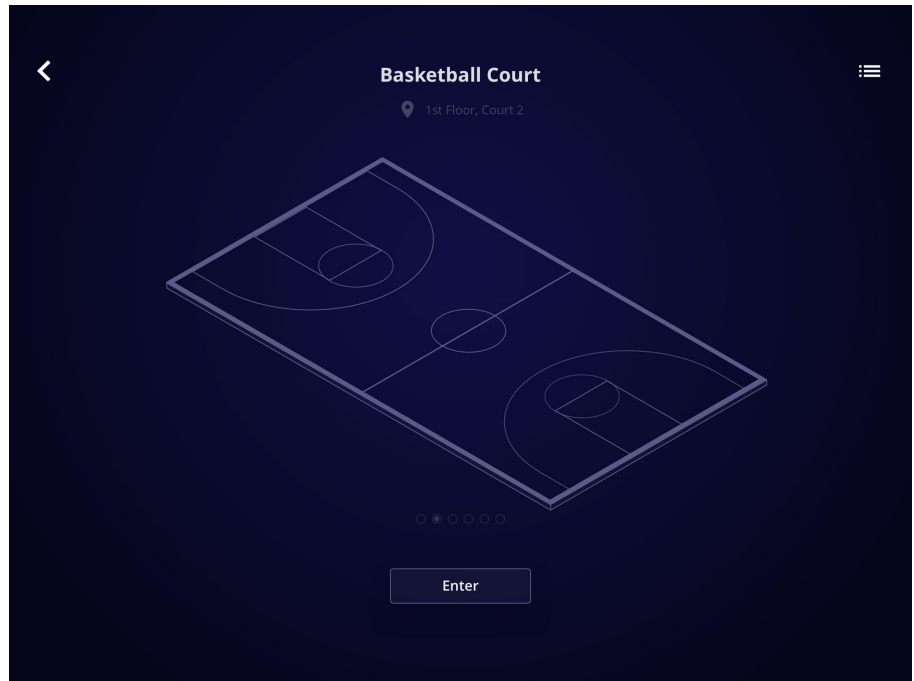
Once a user selects a health club, facilities available in the club will appear in the following screen. A user can select a facility depending on their needs and interests (Figure 17). A list view is available at the top right of the app, which helps wayfinding, particularly for a large health club that has many facilities.

Figure 17.
3D view of the available
facilities



Facility Home Page

Figure 18.
3D view of the available
facilities



Facility Home Page

This home screen of the Freestyle Fitness Room contains available live events held in that facility (Figure 19). The call to action (CTA) button at the bottom is the key component of the page to aid the user in building their exercise plan. Users are always able to find Messenger and My Profile in the fixed header at the top.

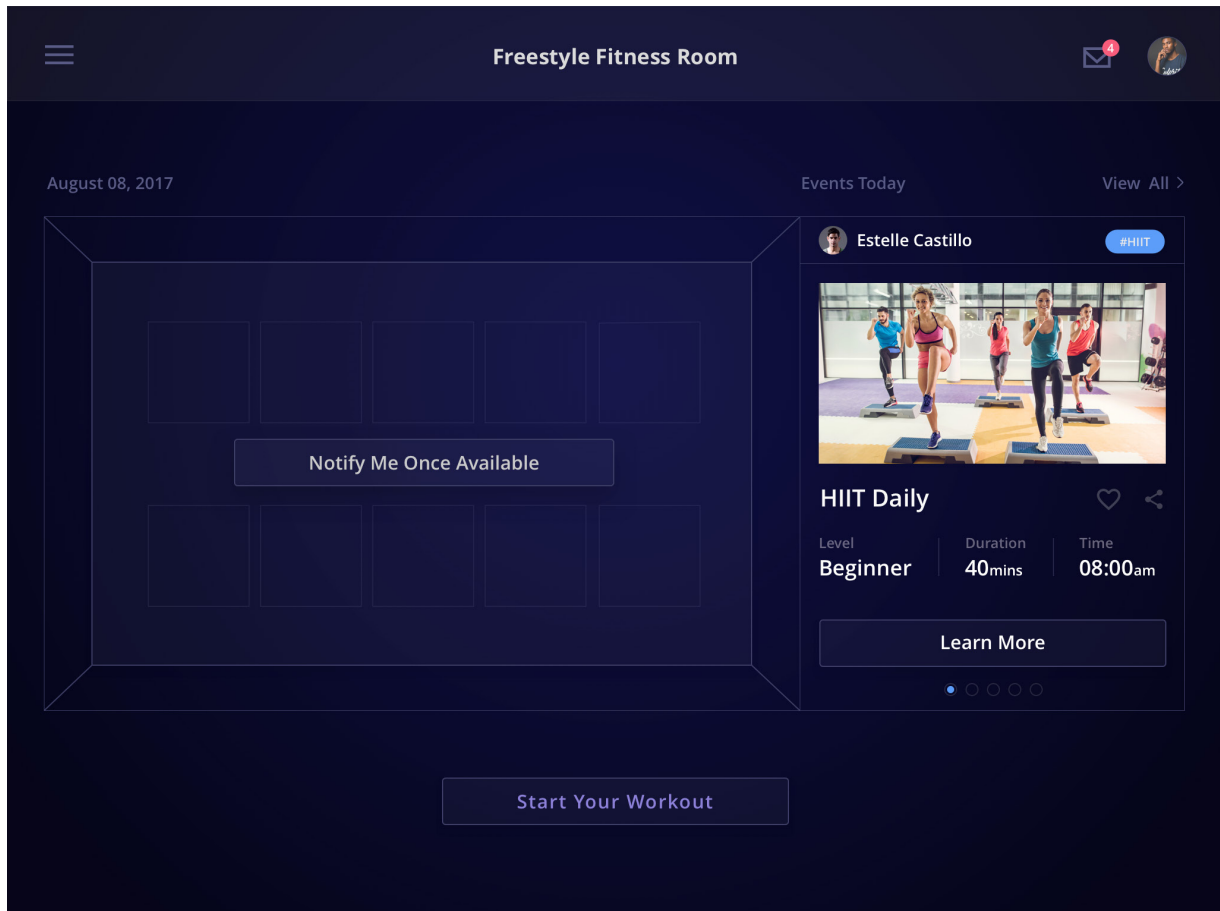


Figure 19.

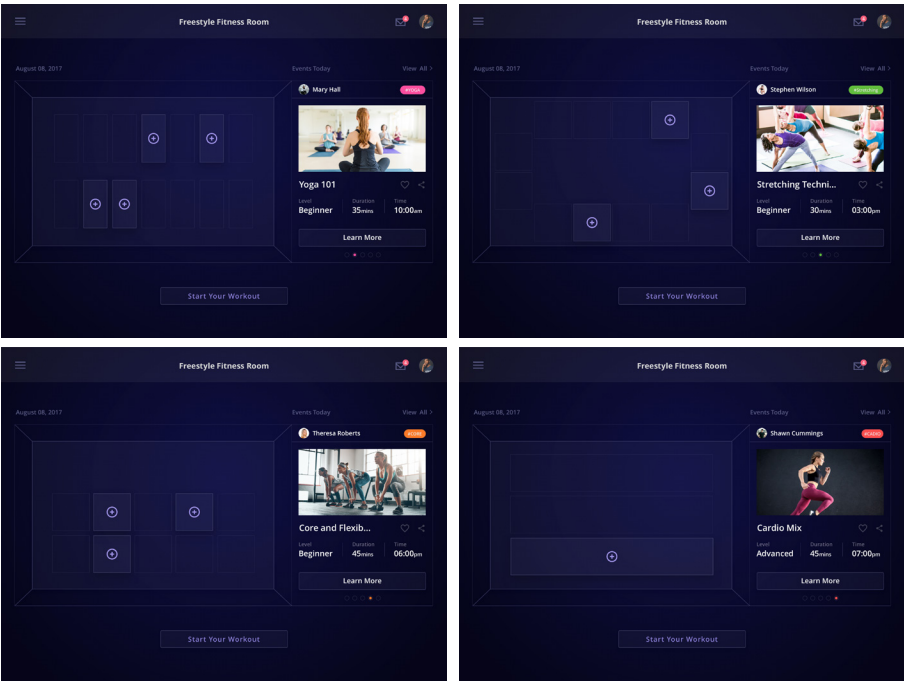
The home screen of the freestyle fitness room

Group Exercise

There are two types of a group event in the app: Events Today and Group Events. While Events Today shows a list of live events provided by professionals, Group Events displays group events hosted by anyone.

Events Today is found on the home screen of a facility, and the list of the live events are updated daily. A user can find up to five events because the gym can host, at most, five events a day in one facility. Simply tapping on a spot leads to joining a live event (Figure 20).

Figure 20.
Examples of live group event
hosted by professionals



Group Exercise

When interested in a live event, users can tap on a spot they like, which will lead them to the Reservation page where they can learn more information about the class as well as read reviews from previous attendants. Once they decide to join in the group, they can simply tap on Confirm (Figure 21).

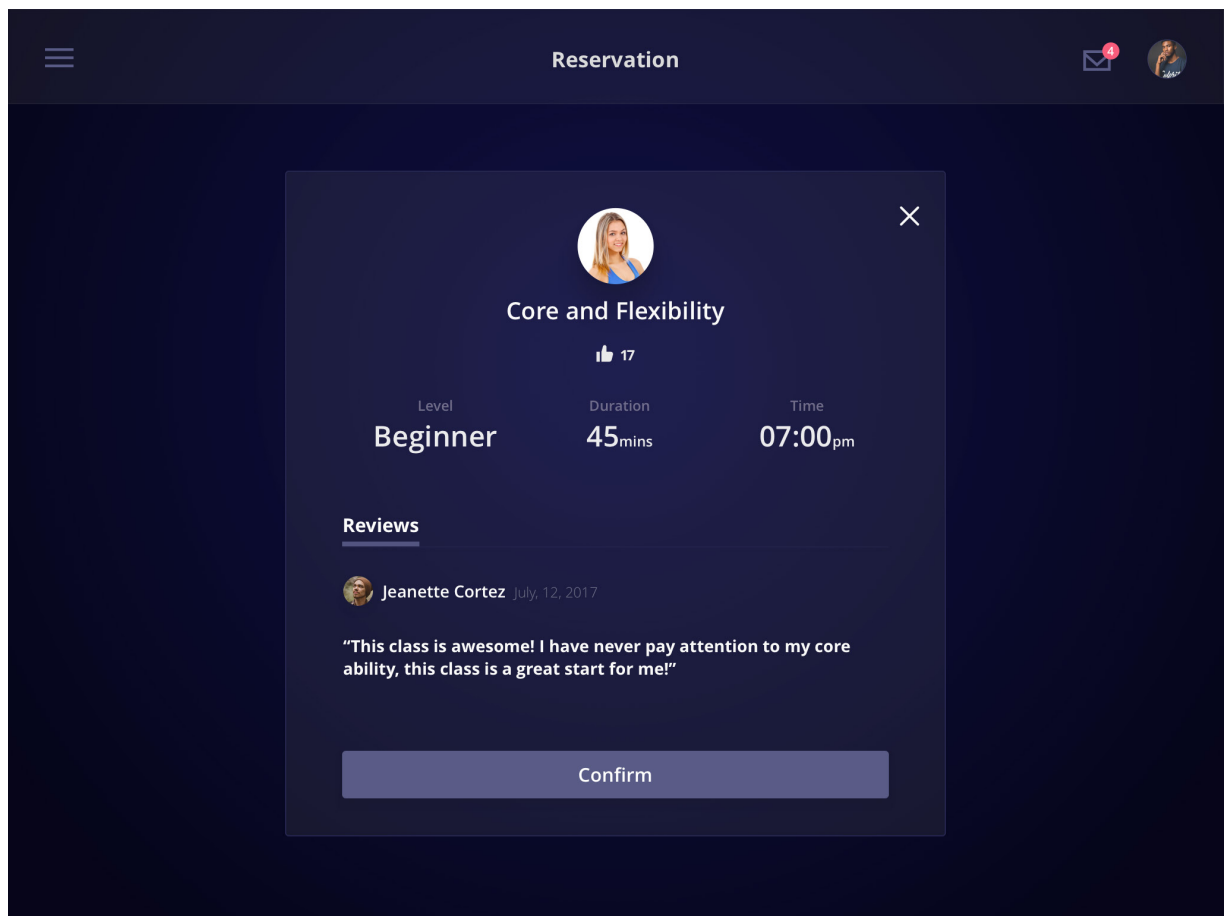


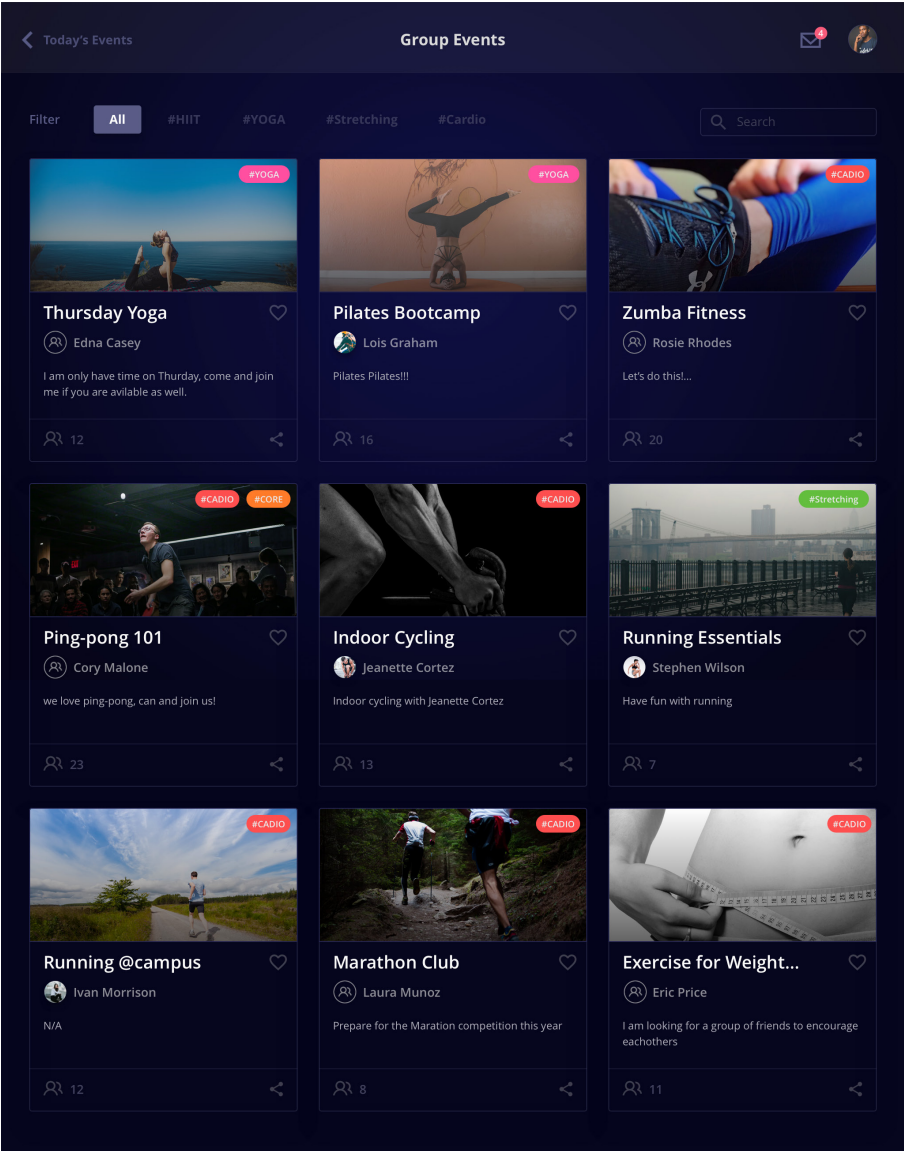
Figure 21.

The Reservation page

Group Exercise

In addition to Events Today, the other type of a group exercise in the app is Group Events. This section exhibits events held by any users. This section enables a user to find others with mutual interests and to exercise together (Figure 22).

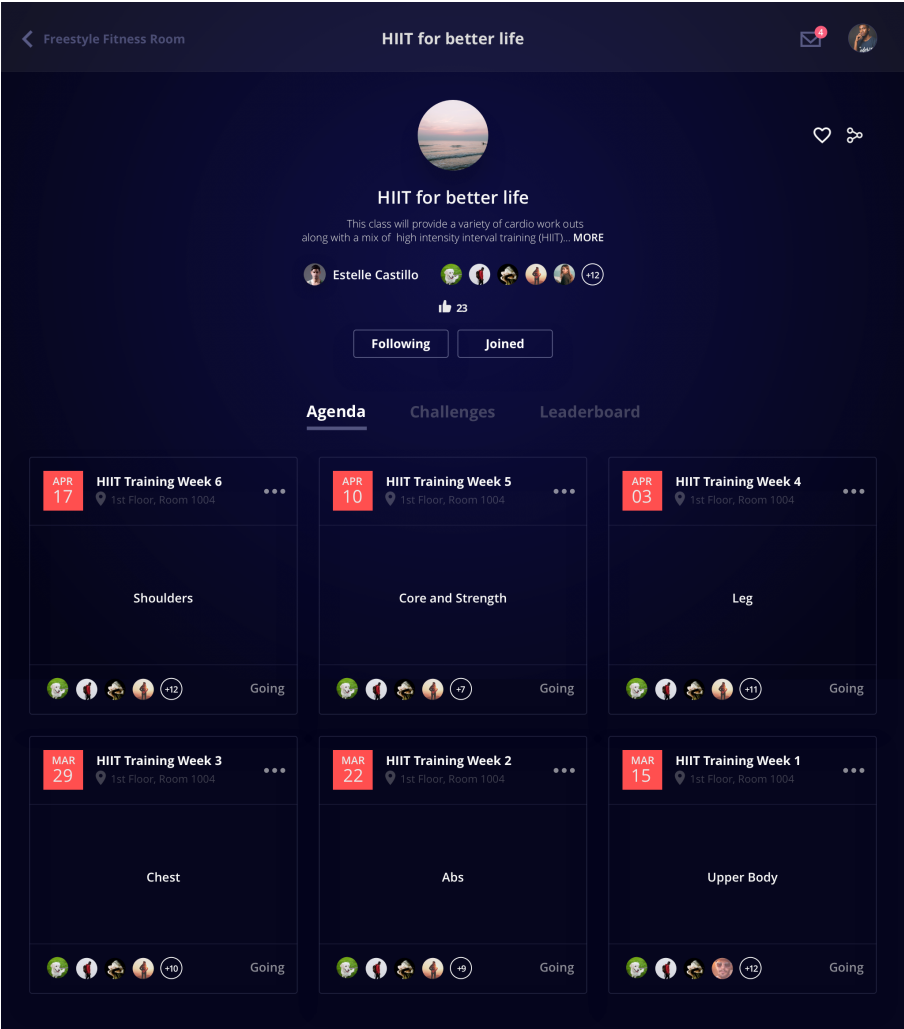
Figure 22.
Group events' list created by members



Group Exercise

Each group event has a profile page where users can browse the basic group information. Then under the information, there is a tab including three sections about the group: Agenda, Challenges, and Leaderboard (Figure 23). Under the Agenda tab, they can check important information in each slot, including its schedule, location, exercise focus, and who will be going.

Figure 23.
Agenda page under profile of
HIIT for better life



Group Exercise

Next, under the Challenges tab, it displays challenges that happened between group members or between users from different groups (Figure 24).

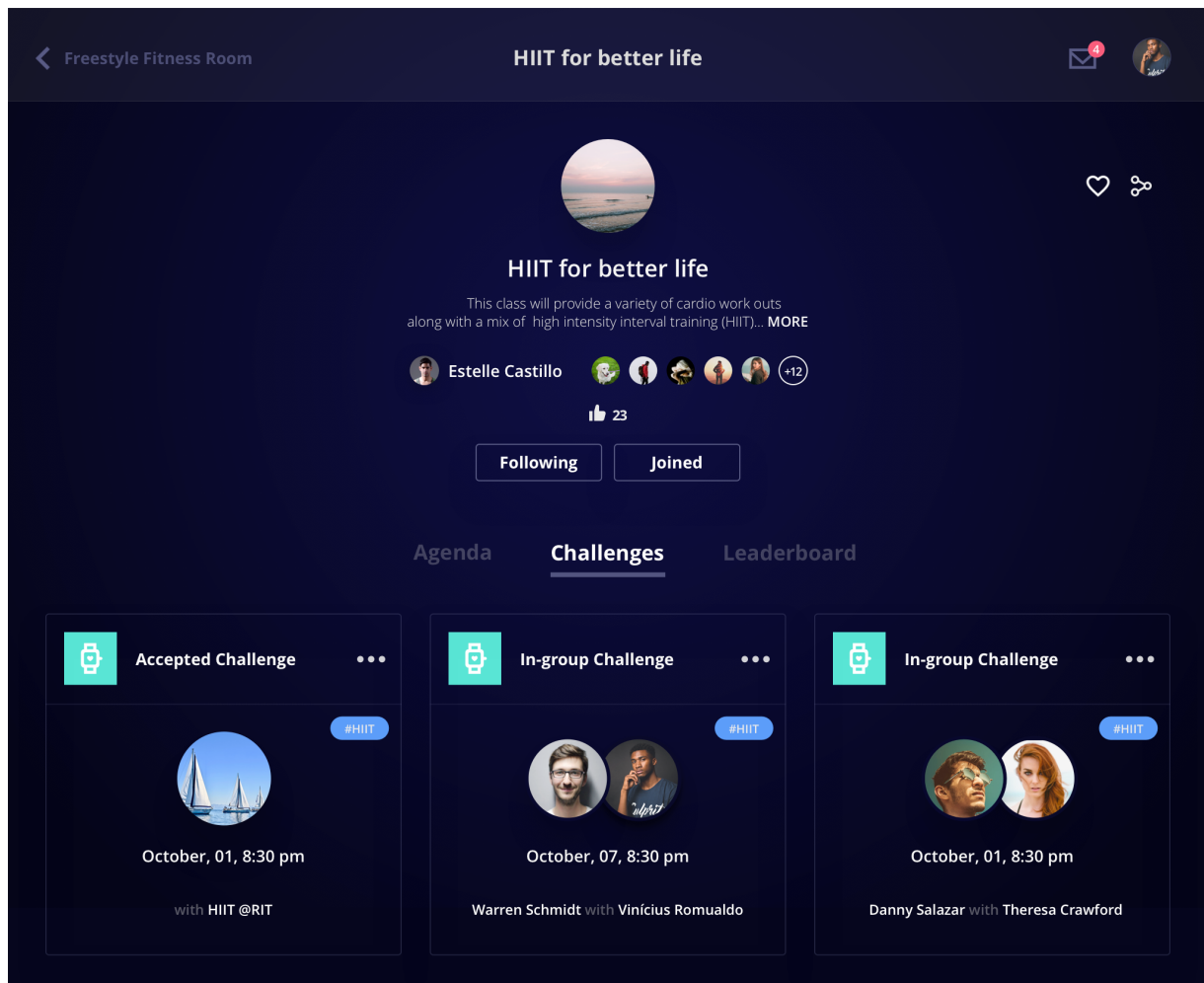


Figure 24.

Group Challenge page under
profile of HIIT for better life

Group Exercise

The Leaderboard tab exhibits the best exercise performers among the group members. A member can join one of them depending on the category or goals (Figure 25).

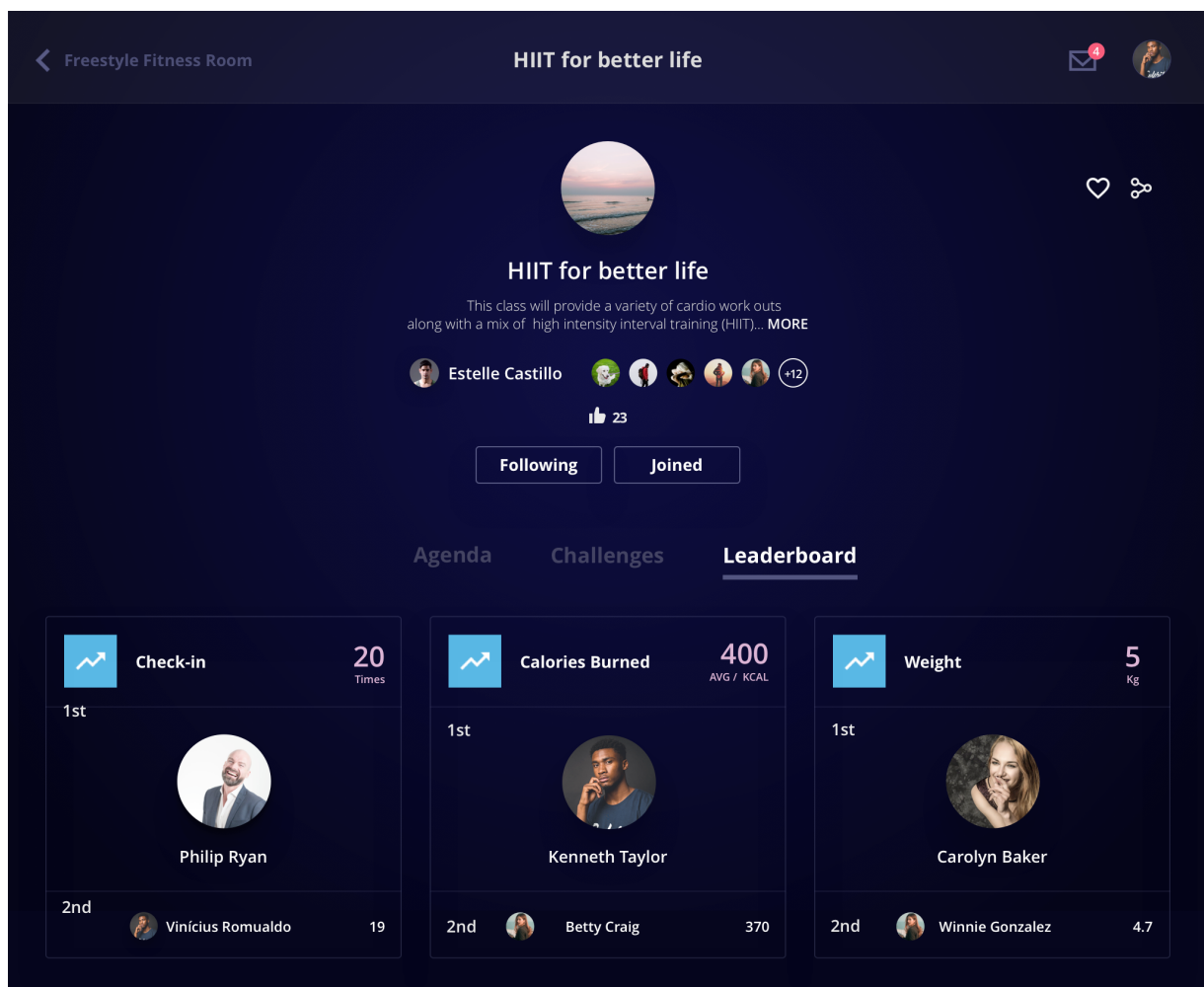


Figure 25.

Group Leaderboard page
under profile of HIIT for better
life

Start Your Workout

The Start Your Workout button is available for all-level users (Figure 26).

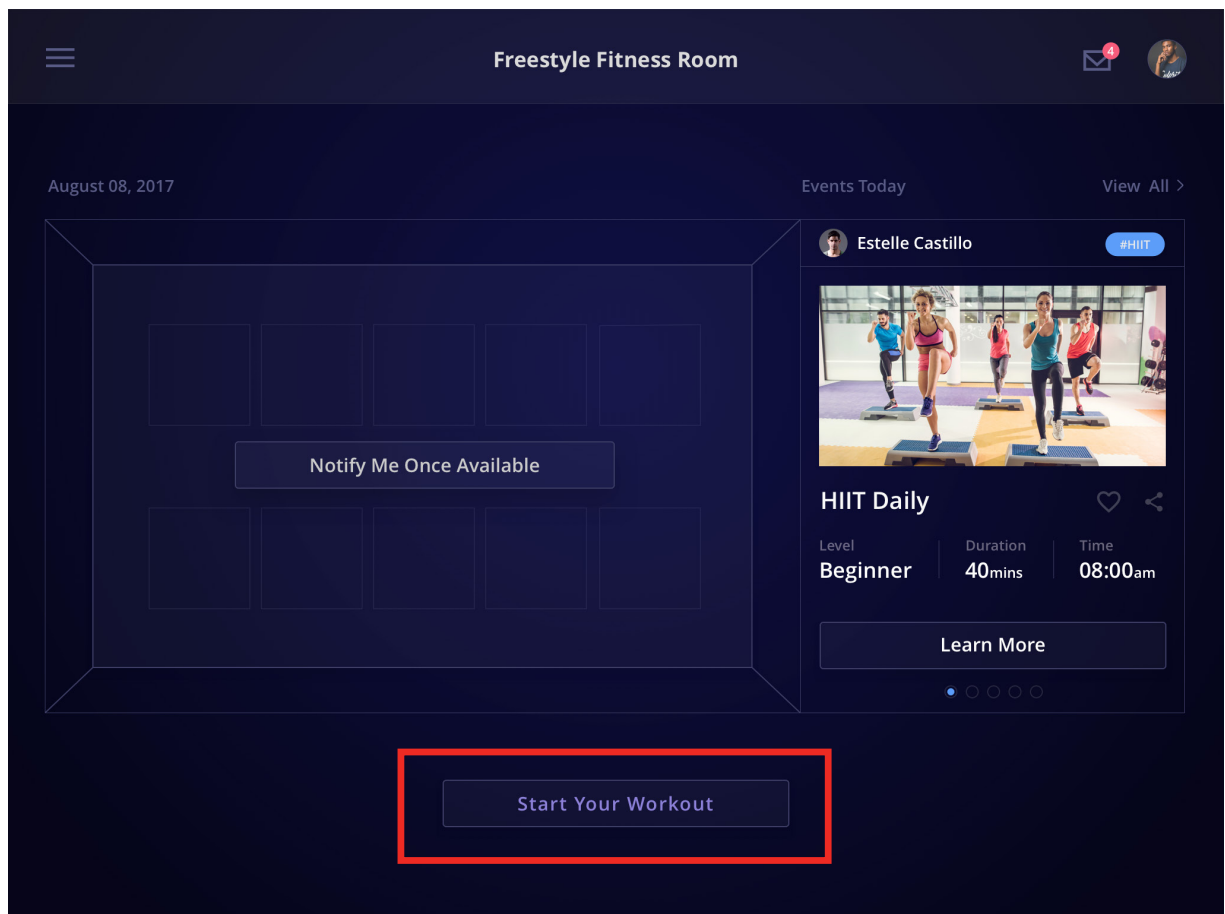


Figure 26. Start your workout

Start Your Workout

A user with limited exercise experience can easily select a time they like and set up the body parts they want to focus on to exercise. Then a beginner's schedule will be generated based on the user's needs (Figure 27).

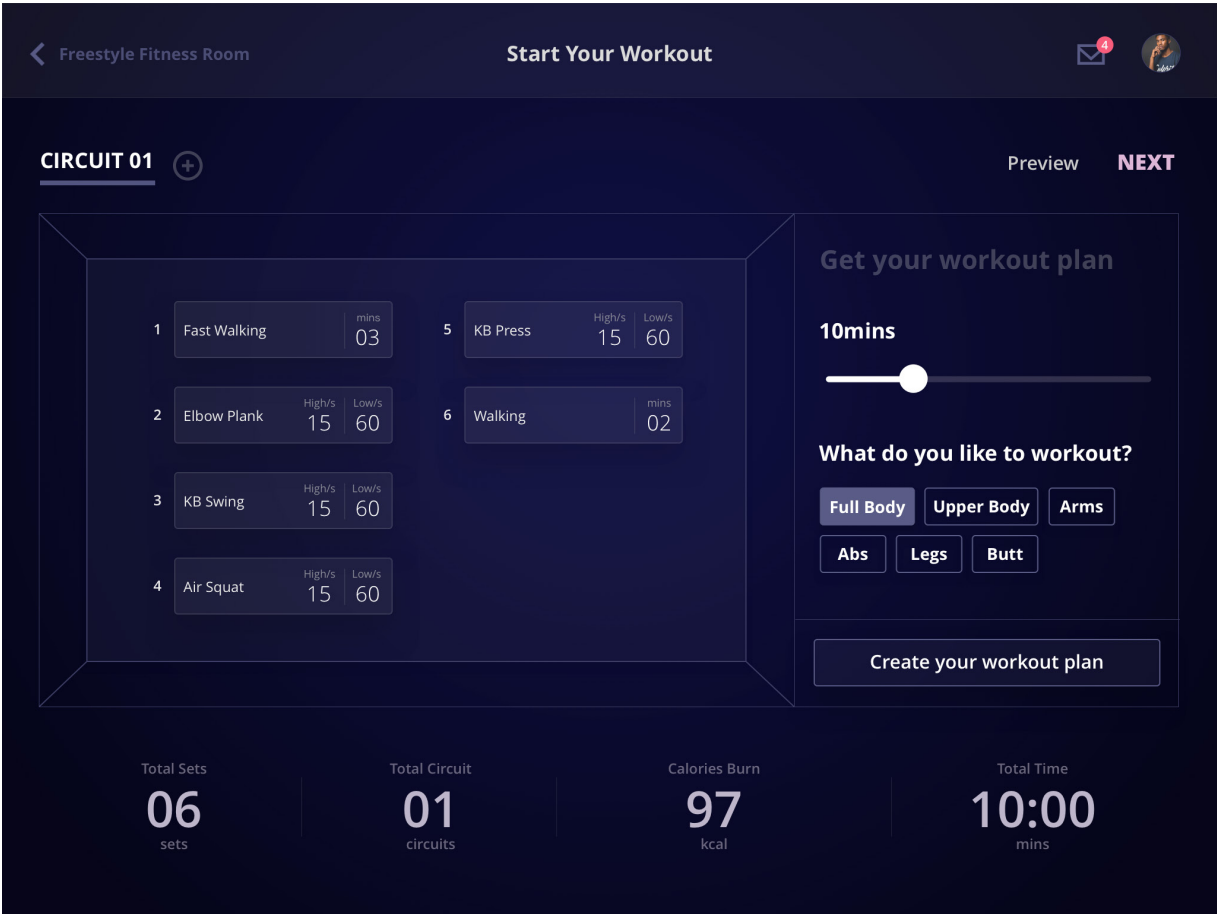
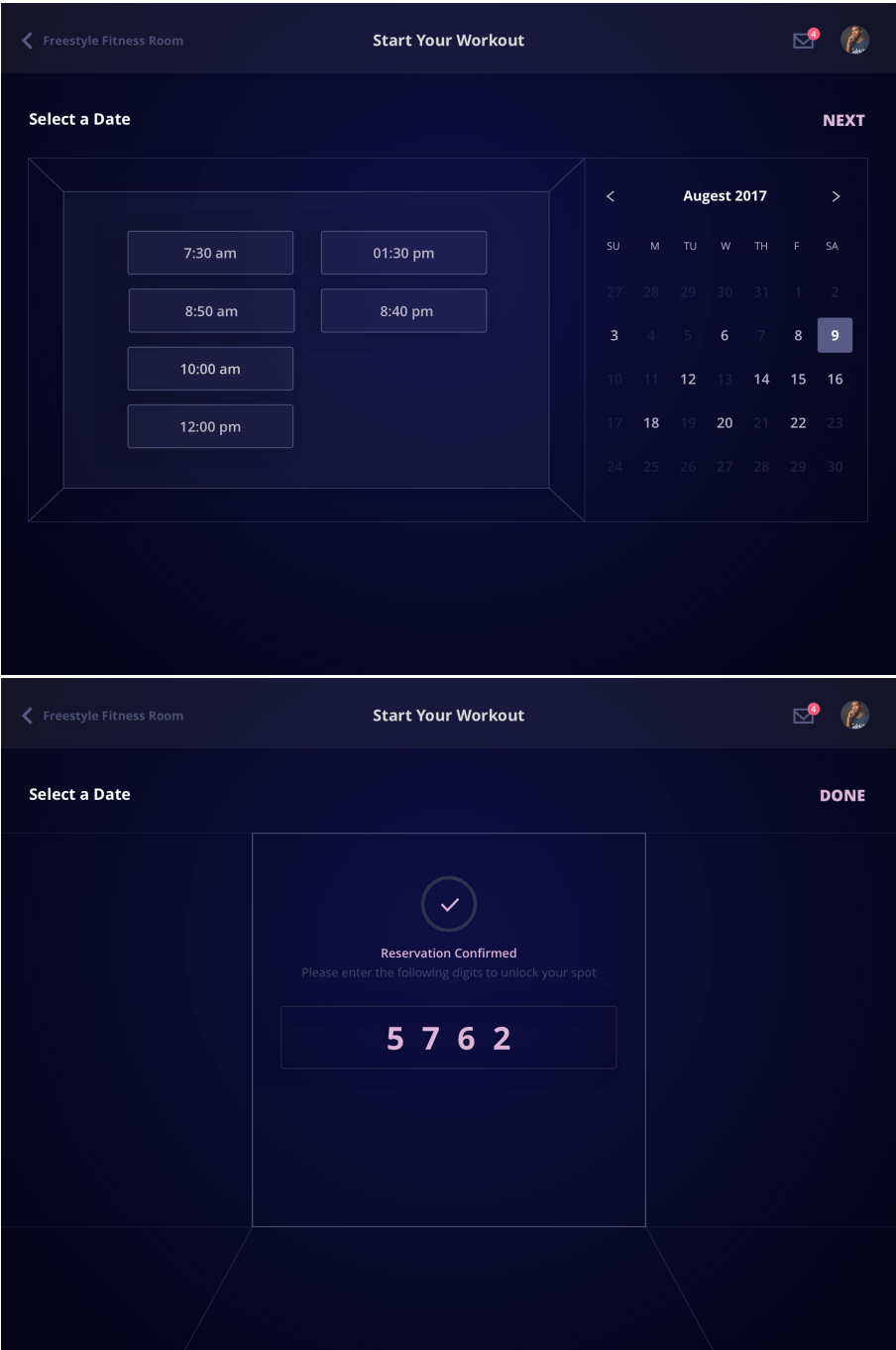


Figure 27.
A beginner tapped on the time slider, then chose full-body exercise

Start Your Workout

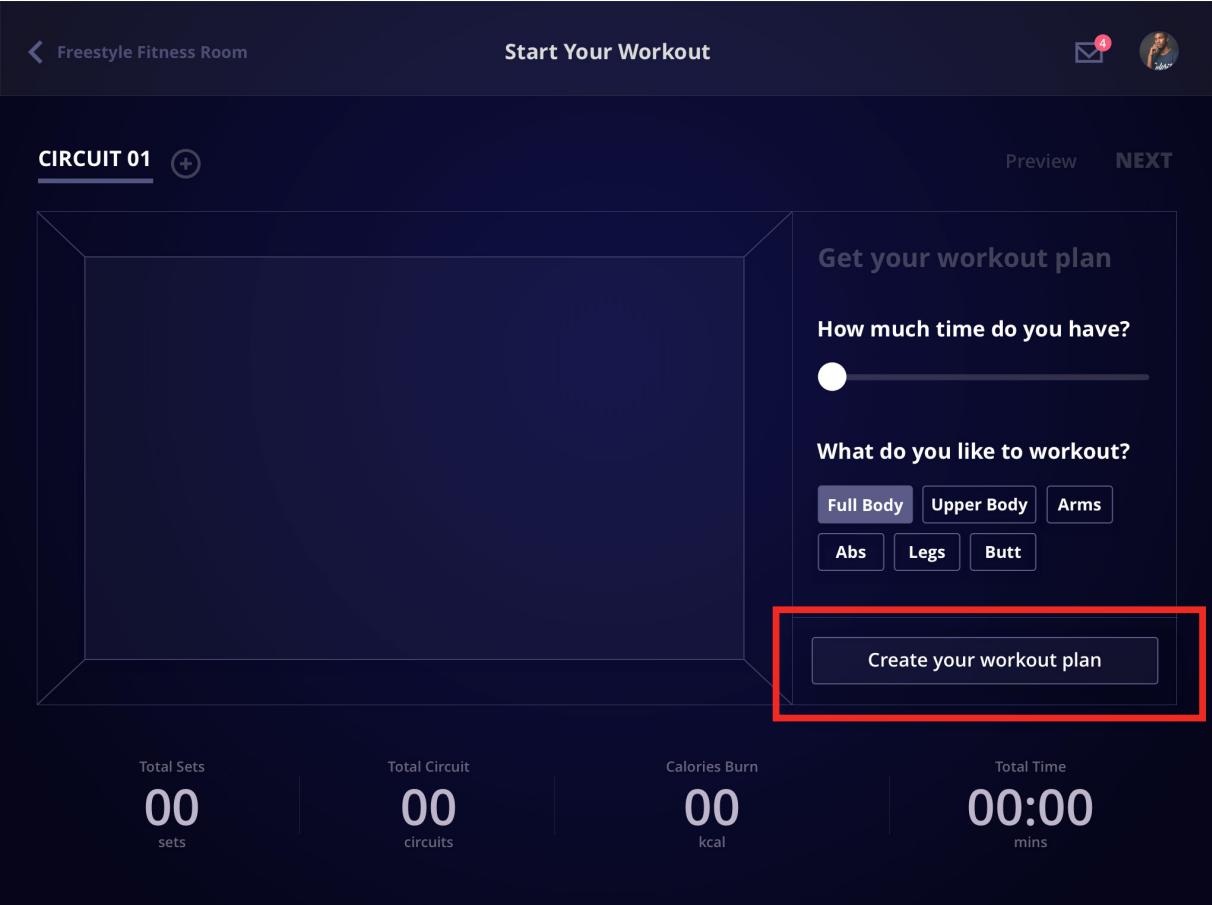
To make a reservation, the user can select an available spot and tap on Next. A four-digit code will be provided for access to the spot (Figure 28).

Figure 28.
Availability of the room and
four-digit reservation code



Start Your Workout

The Create Your Workout Plan button lets users manually control their exercise plans (Figure 29).



Freestyle Fitness Room

Start Your Workout

CIRCUIT 01

Preview NEXT

Get your workout plan

How much time do you have?

What do you like to workout?

Full Body Upper Body Arms

Abs Legs Butt

Create your workout plan

Total Sets
00
sets

Total Circuit
00
circuits

Calories Burn
00
kcal

Total Time
00:00
mins

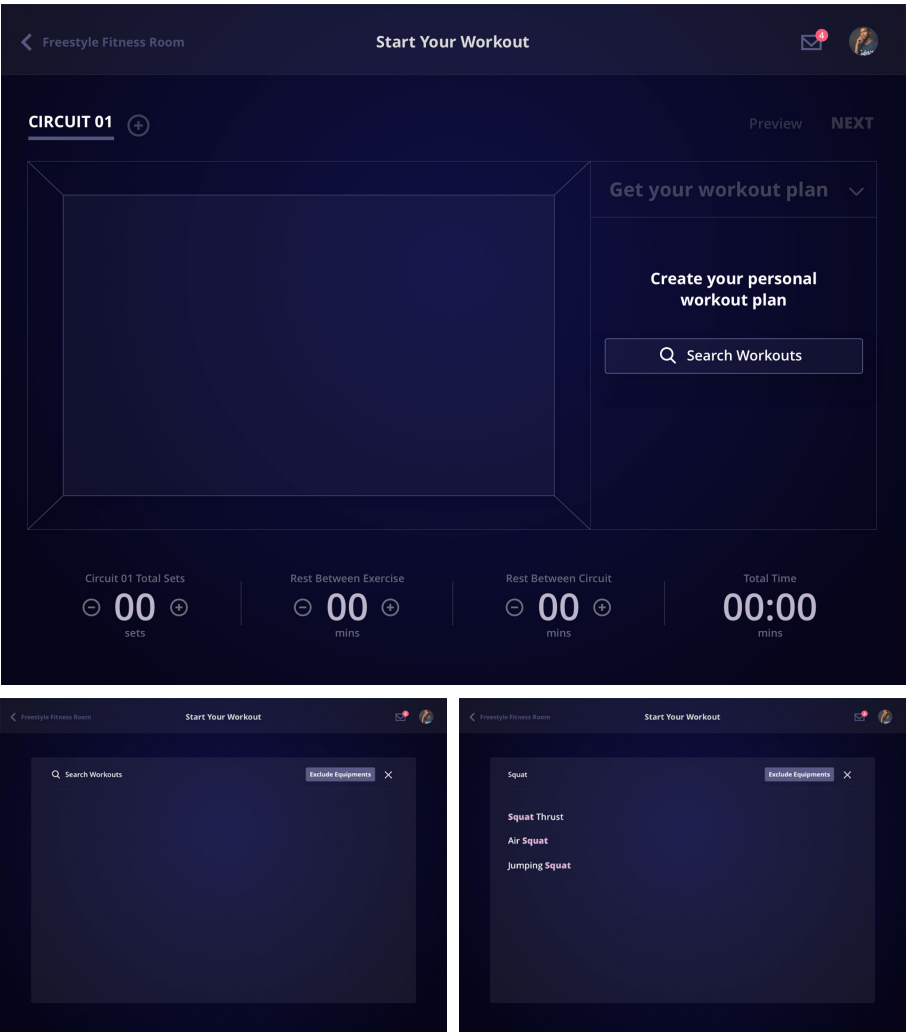
Figure 29.

Create your workout plan
button

Start Your Workout

The first step is to customize a plan and to search for postures. After selecting a posture, a user can determine the repeats and time depending on an HIIT form (Figure 30).

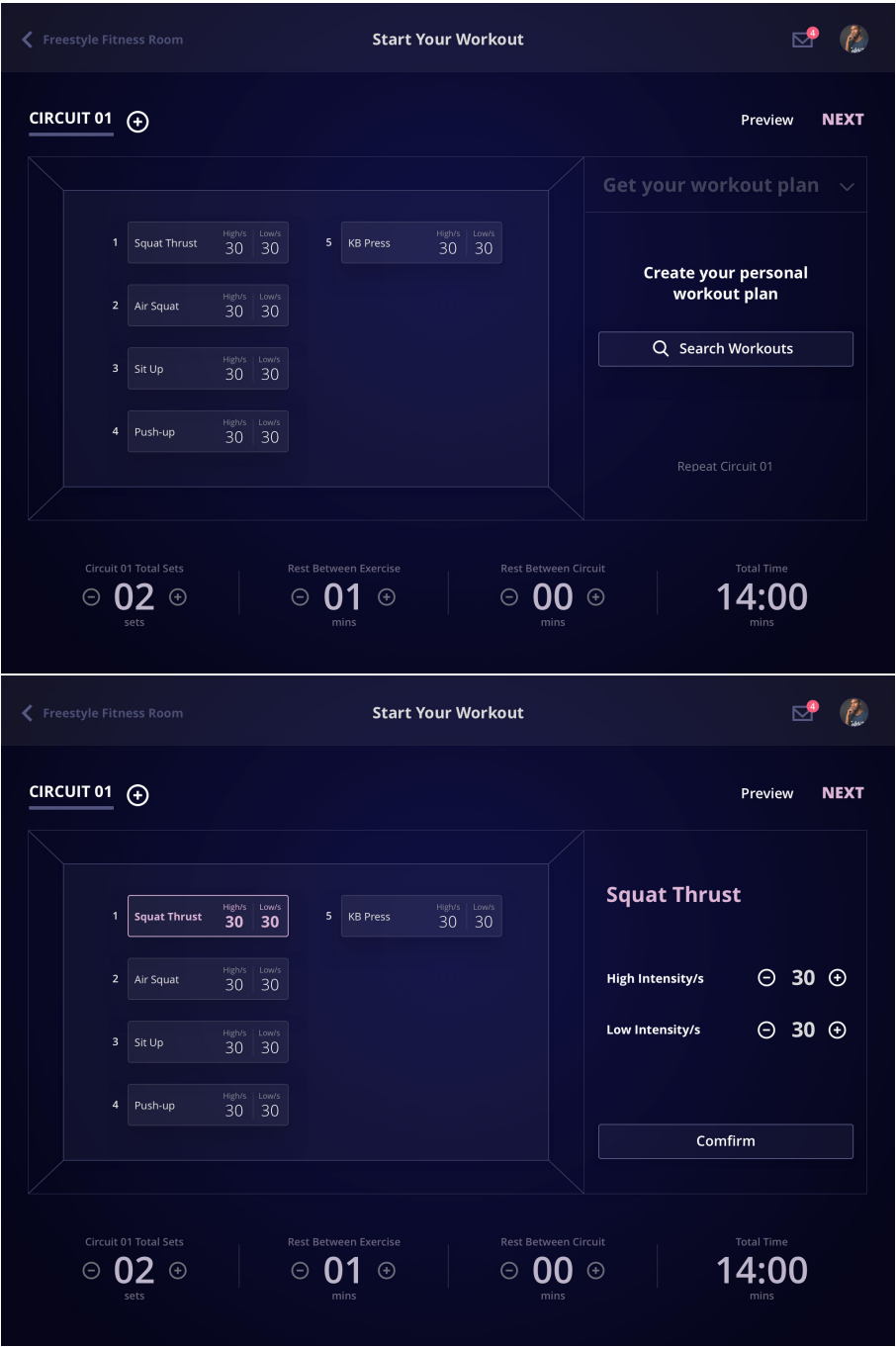
Figure 30.
Customize HIIT plan on the search panel



Start Your Workout

The selected posture can be reordered, reset, or deleted. The settings displayed at the bottom provide the controls of sets and rests (Figure 31).

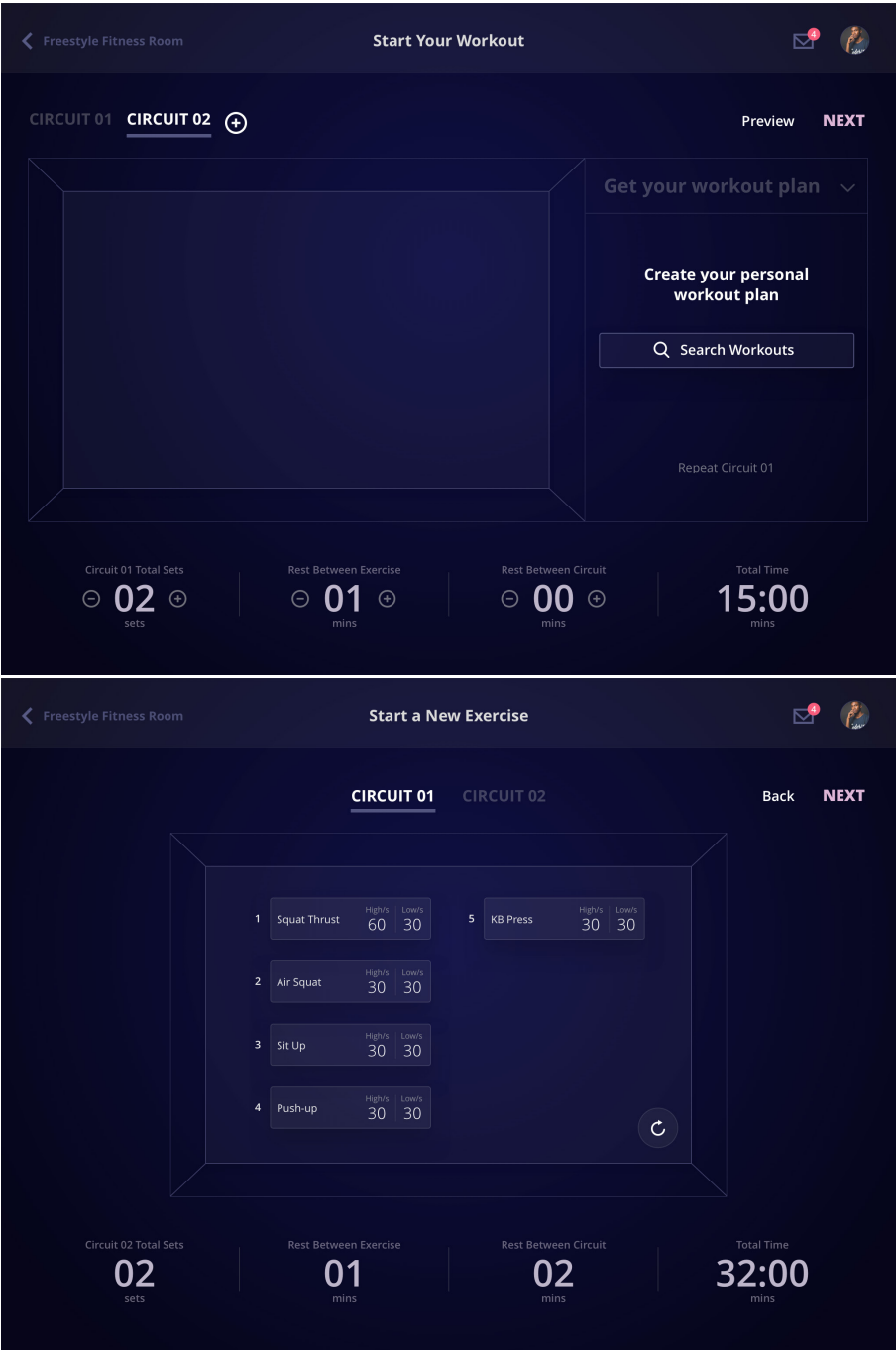
Figure 31.
Edit a selected posture



Start Your Workout

The user can add a new circuit to their plan by clicking the Plus button. The preview allows the user to preview all circuits at once (Figure 32).

Figure 32.
Add new circuit



Start Your Workout

Once the user is satisfied with the plan, the system will lead them to a group information form where they can invite anyone to their workout by tapping on their contacts list (Figure 33).

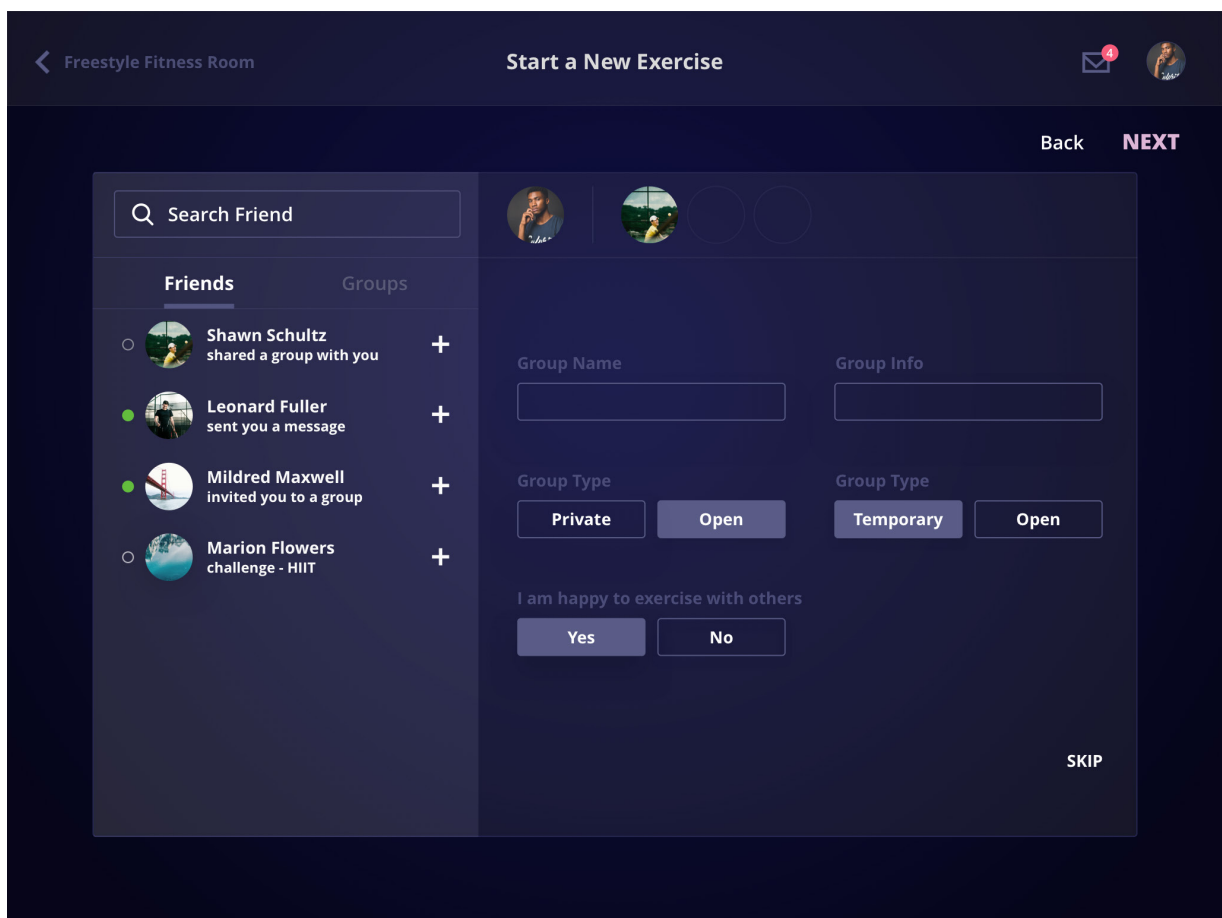


Figure 33.

Add friend to exercise together

My Profile

In the My Profile page, a user can track their performance data, exercise schedule, and history of exercise (Figure 34).

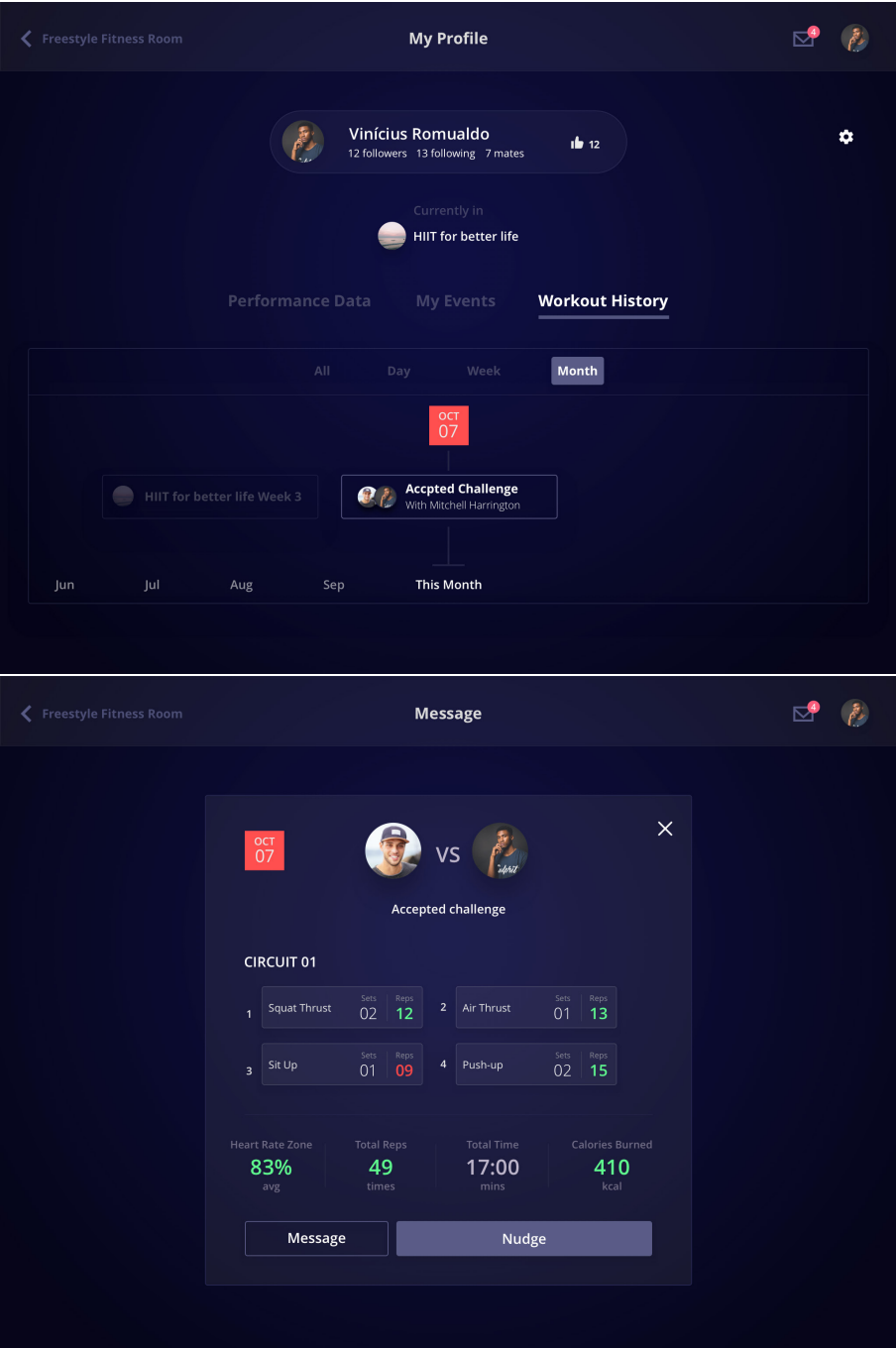
Figure 34.
My Profile



My Profile

Below depicts an example of challenging another exerciser (Figure 35).

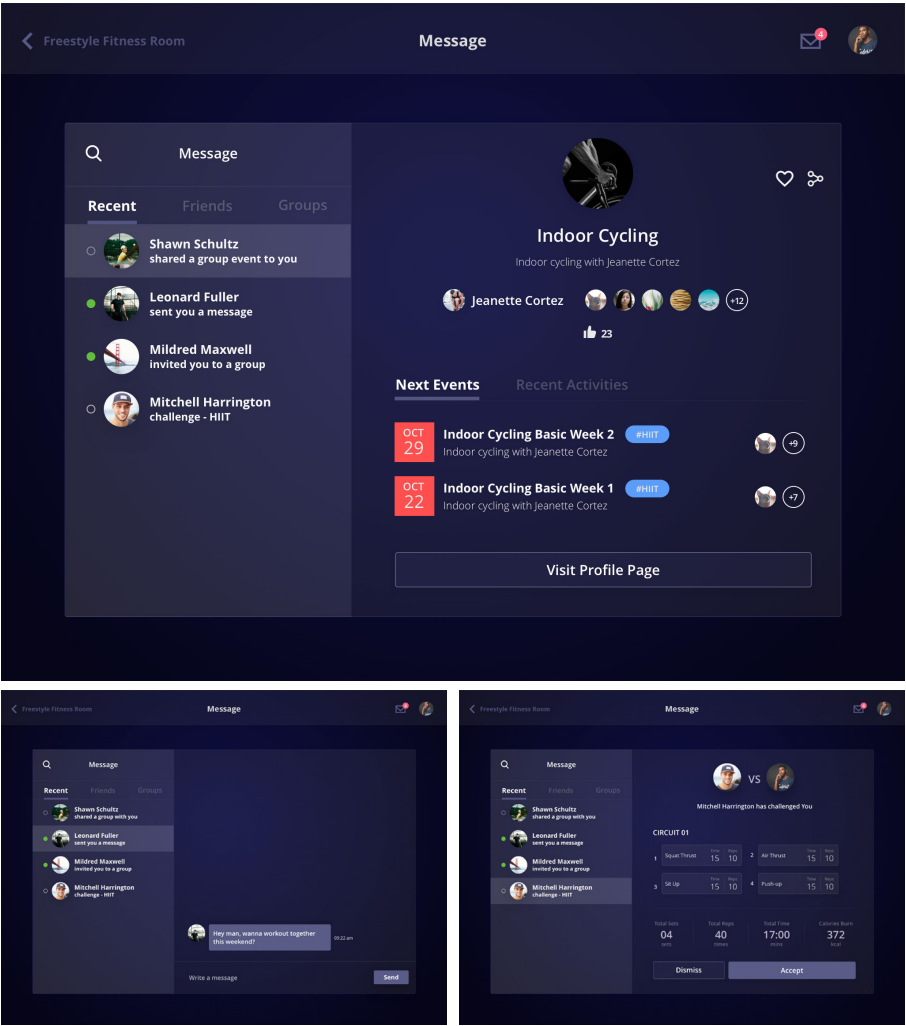
Figure 35.
Challenging results under
History section



Message Center

The communication system is one of the ways to make users exercise effectively. Users can send messages directly to their friends or groups, share groups, challenge friends, etc. (Figure 36).

Figure 36.
Message center



The Interactive Prototype

The interactive prototype built in the InVision app is one of the final deliverables of the thesis project. This tool enables a user in testing and developing a presentation of the design (Figure 37).

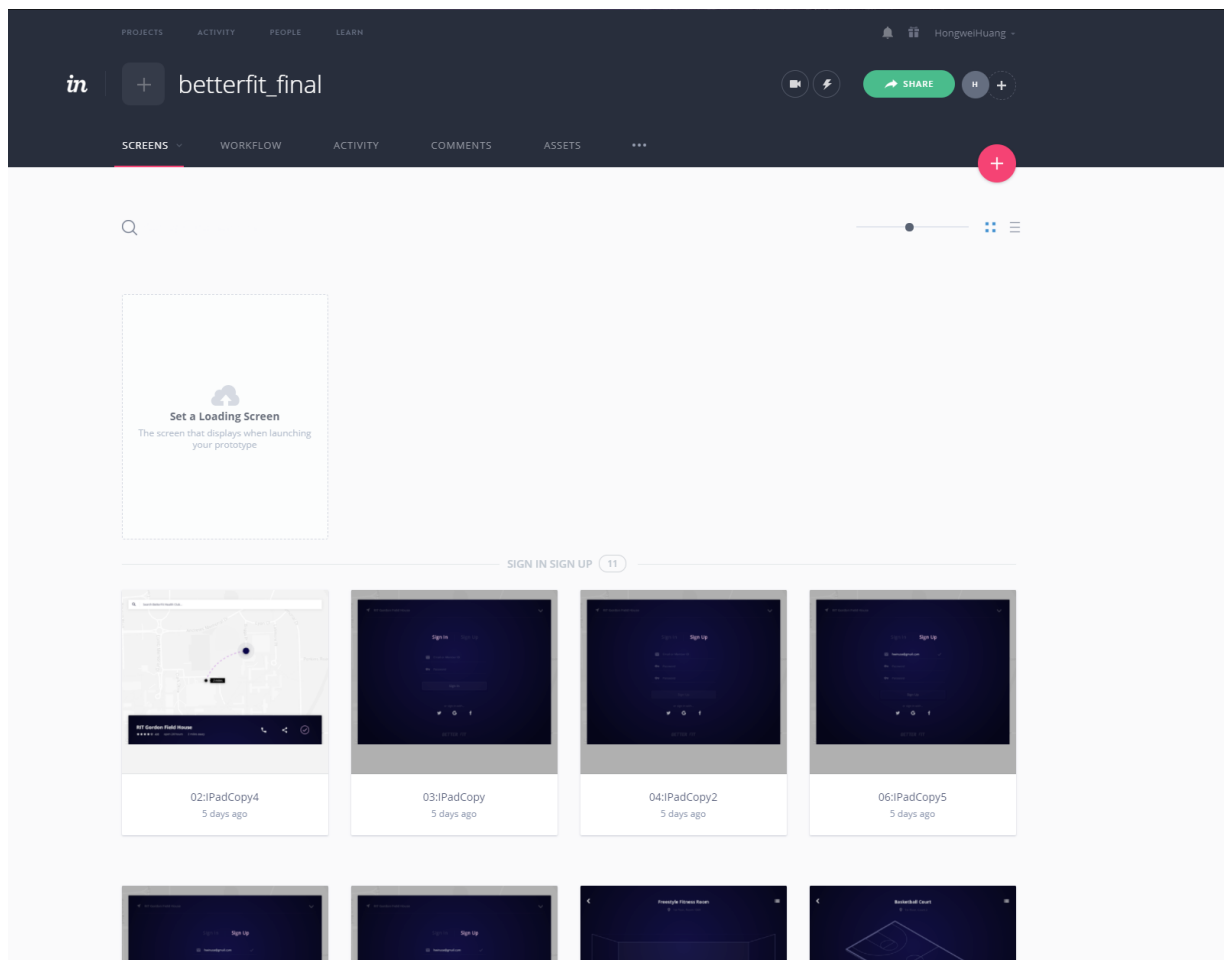


Figure 37.

The interactive prototype in
InVision

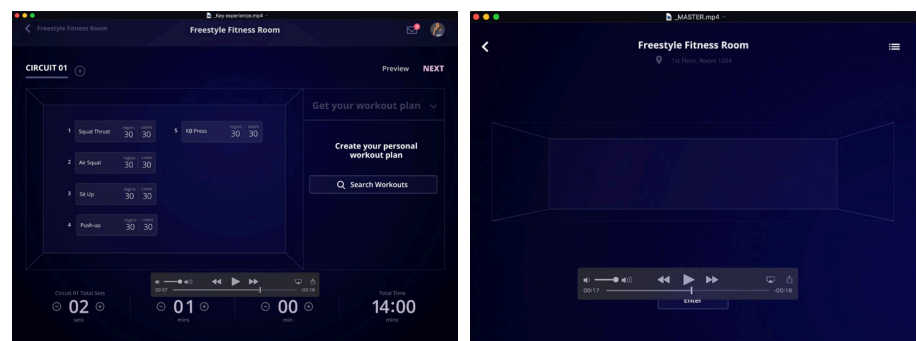
UX Choreography

Good animation helps improve usability of a mobile app in many ways. In this project, user-experience animation has been implemented in order to help users understand the spatial relationships of the app, reduce cognitive load while planning complicated exercise schedules, and create a fluid user experience for return rate. Moreover, by planning the storyboard of the user-experience animation, I had a great opportunity to review the app's information architecture; therefore I clarified the logic behind the project.

UX Animation 1: Key Experience

This movie shows the key user experience of this project. A user gets a direct message from his friend, asking him if he is free during the weekend to workout together. The user decides to accept the invitation. He exits the message center and then clicks on the Start Your Workout button located in the home page that drives him to the exercise planner. He is very familiar with HIIT workout, so he customizes a workout routine via the search system. After he finishes planning his routine, he selects a time to reserve a room for his workout. Then he sets up the room's information and sends an invitation to the friend. Finally, he gets a code to access the room (Figure 38).

Figure 38.
Screenshots of the Key
Experience video



UX Choreography

UX Animation 2: The Home Experience

This story illustrates the transition between five live group events. The animated transition of the Available Spot button (Figure 39) aims to let users immediately know that a group is available for them to join (Figure 40).

Figure 39.
A screenshot of the Home Experience video

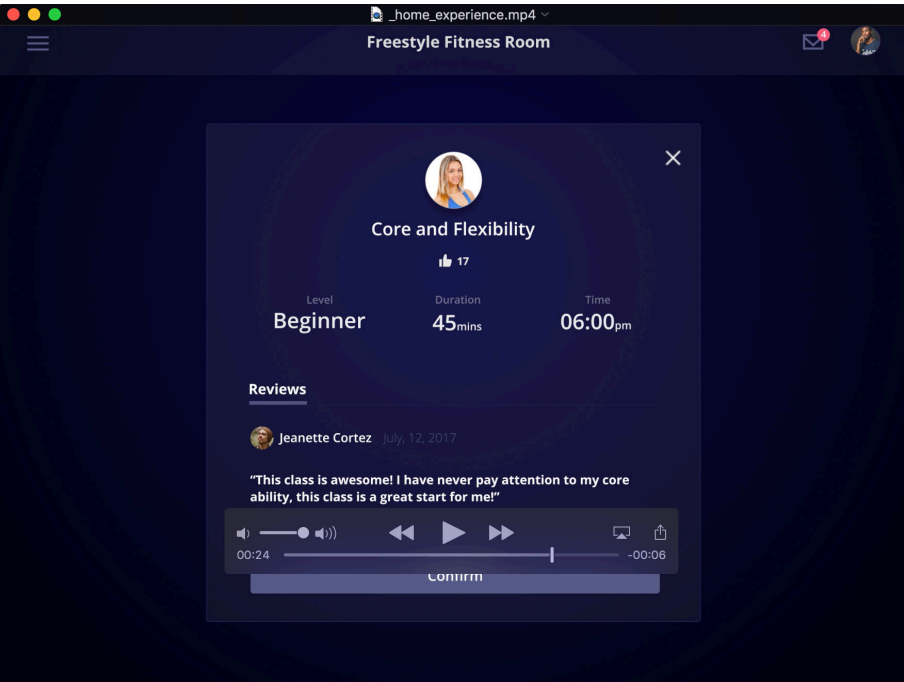
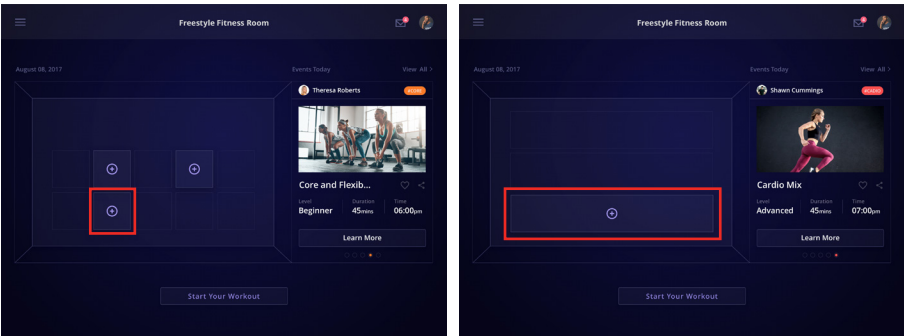


Figure 40.
The red box indicates the Available Spot button



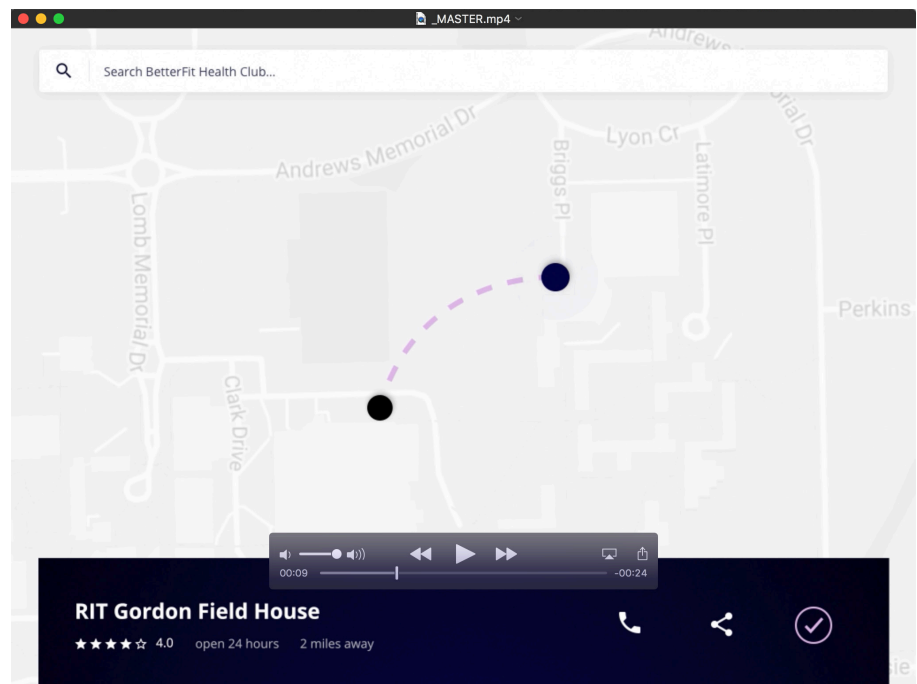
UX Choreography

UX Animation 3: The First Experience

This movie explains the first experience of the app. A user selects a location near him, and the app leads him to the sign-in process. After he selects a freestyle fitness room, an animation of the 3D room appears to help the user understand the spatial relationship of the app. The user finally lands in the home page after going through a short introduction of the fitness room (Figure 41).

Figure 41.

A screenshot of the First Experience video



05

Evaluation

Evaluation

There is not a perfect product; however, always listening to users' feedback can help designers clarify their goals for developing a better product.

Thanks to the great RIT community, I had the opportunity to get comments not only from the potential target audience but also from interaction-design professionals. In the very early stage of the project, communicating with peers and professors helped optimize the structure of the app and build the information architecture. A usability test conducted at Imagine RIT, a university-wide event on the campus, allowed me to achieve the overall goals of the project. The test included designed questions and tasks directed to a testing group while they interacted with the prototype. The observation and recordings during the process helped solve design problems of the project.

The testing result showed that the overall visual design was appealing and delivered the concept of high-technology, which aligns with the intended visual design concept. The participants mentioned that the animation of the fitness room visualized a clear vision of the concept of this project. Moreover, the participants could easily find the group events they were interested in while using the prototype. Making a reservation is a crucial part of this project, and the participants found that the process was simple enough to make a reservation.

However, one main concern during the testing process was the HIIT workout plan; the participants could not understand why the CTA led them to plan the HIIT workout. To help them understand that HIIT is one of the examples of the thesis project, a basketball-court page was added as an option on the facility page.

Evaluation

Another concern was the Message Center where participants felt that excessive information was shown on one page; thus, later, most of the secondary information was excluded from the page even though users still could check out the information by tapping on the contents title when they were interested.

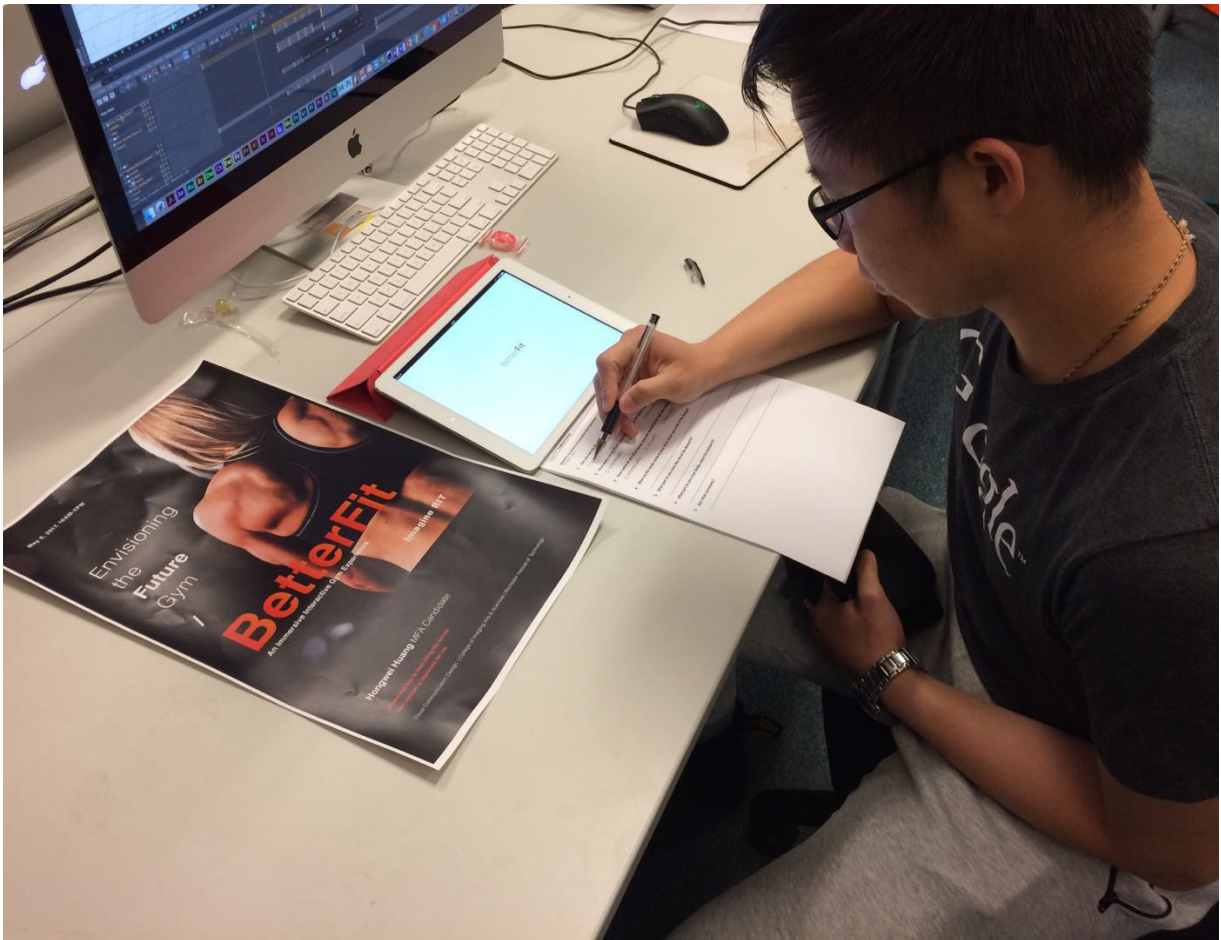


Figure 42.
Usability testing

06

Conclusion

Conclusion

In conclusion, this thesis has bordered my understanding of the importance of prototyping development in a product design process; it adds value to get precise feedback from target audiences. It required that I learn different prototype tools such as Flinto, InVision Design Studio, etc. This skill will definitely help me to understand the engineering efforts in developing a mobile application, meaning a better understanding of designing with limitations. I have also learned the importance of communicating design concepts.

Although this design is conceptual, it can still inspire the industry and show how design can bring technology and user experience together to create an immersive experience and add positive meaning to everyday life.

The effort of researching reactive LED technology could be used to develop an interactive wall for guiding exercisers' movement to help them avoid injuries and perform better.

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Appendices

Appendix A: User Survey

Visual Communication Design Thesis Project Survey May, 2017

BetterFit: A digital visualization concept of the future gym experience
Hongwei Huang

1 What are the reasons for NOT going to the gym / school activities center / health club?
☒ Time ☐ Fear(get injured) ☒ No Partners ☐ Fresh Start ☐ Others _____

2 How helpful do you think a group exercise (Yoga/HIIT class, Partners, etc.) to keep being motivated?
 1 2 3 4 5
 Not at all helpful Not so helpful Somewhat helpful Very helpful Extremely helpful

3 How likely are you to exercise with friends?
 1 2 3 4 5
 Not at all Not so much Somewhat like Very like Extremely like

4 How much are you interested in exercising in a gym with newer technology? (Projection, motion tracking, etc.)
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5 What smart device do you have for exercise?
☐ Watch ☐ Band ☒ Smart Phone ☐ Xbox ☐ Others _____

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Appendix B: Special Permissions

Photos
Illustrations
Video
Audio

iStock
by Getty Images

Boards
Pricing
Hongwei

Find the perfect stock photos, vectors and more...
Images

Overview
Profile
Invoices
Downloads
Apps











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09/14/2017
TO
12/12/2017
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Stock file ID: 483057562 License: Standard Collection: Signature	
	December 12, 2017 12:34 AM Subscription
Stock file ID: 517963642 License: Standard Collection: Signature	
	December 12, 2017 12:34 AM Subscription
Stock file ID: 700718932 License: Standard Collection: Signature	
	December 12, 2017 12:33 AM Subscription
Stock file ID: 840886810 License: Standard Collection: Signature	
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Appendix C: Thesis Proposal

Mirror Trainer

Integrating LED motion tracking and tablet devices to create
new gym-based workout experience

Thesis Proposal submitted by

Hongwei Huang

MFA Candidate

Rochester Institute of Technology
College of Imaging Arts and Sciences
Visual Communication Design
Fall 2015

Thesis Committee Approval

Title MirrorTrainer: Integrating LED motion tracking and tablet devices to create new gym-based workout experience

Submitted by Hongwei Huang
Feb 15, 2016

Approvals Committee Members:

Nancy Ciolek, Associate Professor
School of Design, Visual Communication Design

Chief Advisor Date

Chris Jackson, Professor
School of Design, Visual Communication Design

Associate Advisor Date

Daniel DeLuna, Associate Professor
School of Design, Visual Communication Design

Associate Advisor Date

Abstract

Mirror Trainer is a thesis which explores the potential possibility connecting gym-based high-intensity interval training (HIIT) experience with interactive design. The final project involves a motion prototype for projecting in a workout space as well as an interactive prototype for Apple iPad.

This prototyped experiential user interface is designed to project in the mirror and floor refers to the user experience of workout flow and performance feedback. Workout information such as equipment needs will be displayed in the mirror and floor. A series of interactive posture correction instructions that would be useful for preventing injuries.

The iPad application is designed so that once a user has set up a training plan, the workout process will be projected in the mirror and floor of a freestyle workout room. Key workout information will be recorded to help users track their workout performance.

Overall, this thesis aims to help improve the safety and efficiency of workout in the gym freestyle room by considering user experience design, user interface design, and motion design.

Keywords

Fitness, High-intensity interval training, LED motion tracking, Experiential user interface design, User experience design, Motion UI, Interactive Design

Situation Analysis

It is generally accepted that exercising can help people maintain a healthy lifestyle. A well-designed gym provides an ideal environment that includes almost all kinds of equipment that are necessary for trainers.

However, gym injuries have become one of the reasons that interfere with persisting to train in the gym. According to a survey from University of Arkansas, 35% gym injuries has increased in recent years¹. For fitness beginners, reading technical books or checking video tutorials can be a way to help reduce some possibilities of gym injuries, but there are many difficulties of understanding terminologies, memorizing all of the process, and other obstacles. Having a personal trainer plays an important role in reducing the risk of gym injuries, but not everyone can afford the high cost of hiring one.

A healthy exercising style requires a long-term schedule and being persistent in exercising. A highly efficient workout environment can help keep a healthy and regular exercising schedule. However, a regular schedule needs to be maintained. Some users choose to keep a schedule note and always bring it with them, but it is time-consuming to check notes between their workout gaps. For some beginners, they even need to check videos if they forget some of the correct postures. Thus, having a high efficiency workout experience can save time to for other activities, such as work or study, as well as encourage more people to engage in exercising.

This thesis will concentrate on integrating new technology and the gym-based environment. The development of LED motion tracing technology enables us to project a creative user interface on a surface. The goal is to design a prototype of a new workout experience by connecting a digital device with an interactive workout environment.

¹ <http://www.mensfitness.com/training/five-most-common-gym-injuries>

Problem Statement

Can an interactive workout environment connected to a digital device help reduce the risk of gym injuries?

The MirrorTrainer's concept was discovered by observing a gym. There is no gym without a built-in mirror. Workout in front of mirrors allows users to adjust their posture. But for beginners, the lack of knowledge regarding to fitness leads them to do poor and dangerous posture.

To solve this problem, an experiential user interface will be projected in a freestyle room of the gym. By interacting with a series of posture tracing games, beginners can understand the right posture in a clear way. For advanced users, the biggest cause of injuries is improper workout styles. The design of the interactive environment can also help with this problem. As the iPad application collects information from their workout performance, they can track and analyze data to help them build a safer and productive schedule.

Can an innovative interactive workout environment encourage people to engage in exercising?

A hectic schedule is one of the main reasons that people fail in exercising. Sharing and analyzing data between the workout program and digital devices can help users build a flexible schedule. Furthermore, the workout system will be designed to allow multiple users to train together, and compete with each other's exercising abilities.

Survey of Literature

Don't make me think: A common sense approach to web usability.

Krug, Steve. Indianapolis, Ind;London,; New Riders. 2nd ed. 2005

This is a fundamental guide book for beginners of website design. The author illustrates principles of good website design through clear content. The methodology of usability testing is the most valuable part of this book. A well-prepared usability testing can help designer improve their design in an effective way. Also, usability testing can benefit a company to save budget because it can predict the future errors of a new project. Moreover, this book includes many screenshots of examples to help readers understand the content.

Mobile usability

Nielsen, Jakob, and Raluca Budiu. Berkeley, CA: New Riders. 2013

It is an excellent book that introduces interaction and user experience design based on empirical research. This book provides an insight of how to understand the users' needs for both designers and developers. The numerous examples of website design for mobile device illustrates the importance of simplicity in mobile user experience design.

Designing interface

Tidwell, Jenifer. Sebastpol, CA: O'Reilly. 2006

This book provides an overview of user interface design patterns by analyzing various examples. The example of user interfaces cover multiple screens of desktop and websites, which are useful for design students to use it as a guidebook to improve their design skills.

Survey of Literature

Type on screen

Lupton, Ellen, and Noel Cunningham. New York: Princeton Architectural Press. 2014

This book shows numerous benefits for designers who work with typography on screen. This book can be a perfect guide for designers to select a good typeface for screen. The integration of historic background and theories of type on screen provides a special insight helping designers understand screen-based type.

Infographic designers' sketchbooks

Heller, Steven, and Rick Landers. New York, NY: Princeton Architectural Press. 2014

This book is an inspiring book for infographics. The various examples that collected from famous designers' works with sketches and ideas are helpful. And it is a great resource to understand information architecture.

Tabata Workout Handbook: Achieve Maximum Fitness With Over 100 High Intensity Interval Training Workout Plans

Roger Hall. Hatherleigh Press. 1 edition. 2015

This book covers variety of exercise plans based on the Tabata's study. Tabata's HIIT workout theory is one of the most high reputation for HIIT training, it originally applied in Japan Olympic Speed Skating training team.

Survey of Literature

Strength training anatomy

Delavier, Frédéric. 3rd ed. Champaign, IL: Human Kinetics. 2010

It is an anatomy book that talks about exercising and muscle involvement. By understanding the connection between muscles and exercising postures, trainers can build spiritual recognition while exercising to improve their performance. Also, as injury prevention and recovery are related to muscle movements, a deep understanding of muscle anatomy is needed to avoid gym injuries.

Five Most Common Gym Injuries

<http://www.mensfitness.com/training/five-most-common-gym-injuries>

This report talks about the most common gym injuries and its solutions. Also, this report mentions about the rising of gym injuries should be paid attention by exercisers.

Storyboard Design Course: Principles, Practice, and Techniques

Giuseppe Cristiano. Barron's Educational Series. 2007

The author presented the fundamental methodologies of storyboarding for people who want to explore designing storyboards. It is especially helpful since the contents are well-organized and sectioned by different courses.

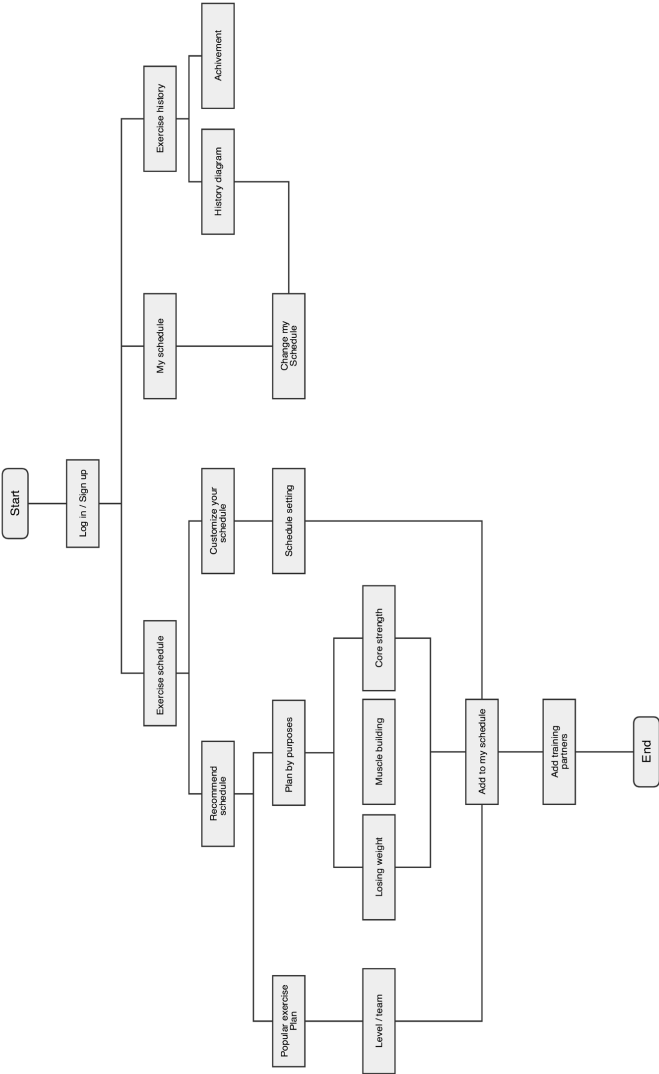
Creating Motion Graphics with After Effects: Essential and Advanced Techniques

Chris Meyer; Trish Meyer. Focal Press; 5 edition. 2010

This is a guidebook to help beginners to understand After Effects from fundamental to professional skills.

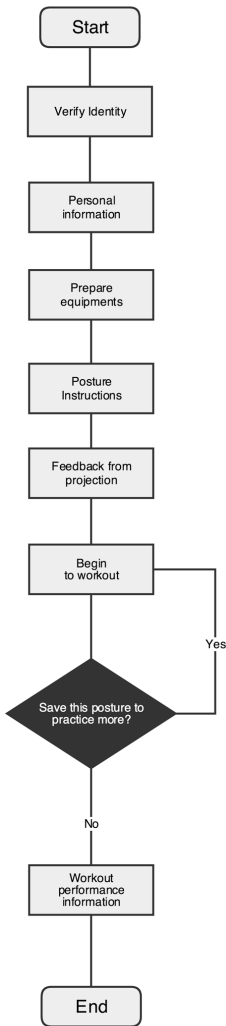
Design Ideation

Mind Map (iPad)



Design Ideation

Mind Map (Interactive Room)



Design Ideation

User Persona

Name: John Smith

Age: 35 years old

Gender: Male

Education: Graduate student in university

Residence country: the United States

Nationality: American

Location: San Francisco

Personality: Clever, Friendly, Chatty and Dependable

Archetype

Smith is a graduate student who studies in a university in San Francisco. He spends most of his time in a lab as he pursues a PHD degree; he sits for a long time a day. He has felt painful in his back recently. His colleagues recommend him to workout in a gym to treat the backache but he has no idea about exercising.

Design Ideation

User Persona

Name: Nate Eric

Age: 36 years old

Gender: Male

Education: Bachelor degree

Residence country: the United States

Nationality: American

Location: New York City

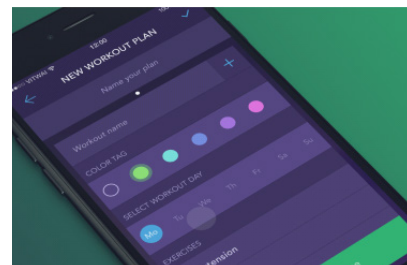
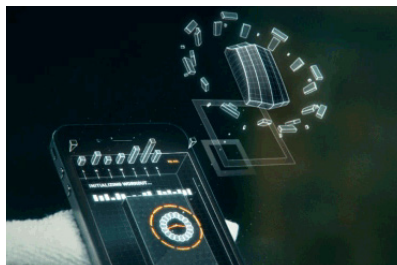
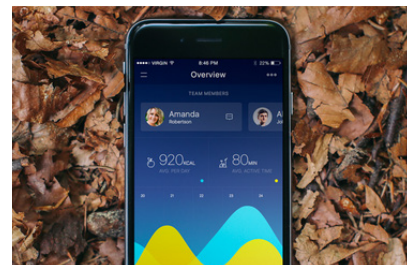
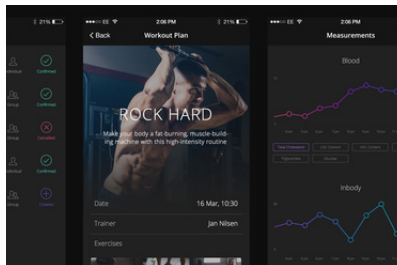
Personality: Energetic, Outgoing and Passive

Archetype

John is a lawyer working in New York City. He enjoys spending time in a gym and has 3 years workout experience. The reason why he likes exercising is it can keep him energetic so that he has an excellent performance in his work.

Design Ideation

Design Inspiration



Methodology

Objective

Utilize LED motion tracking technology and Apple iPad to prevent gym injuries and plan efficient exercising schedule for the gym customers. This new experience includes two parts, an iPad application and an interactive experimental interface design for a gym freestyle room.

Research

- Research scientific methodologies for High-intensity interval training from technical books as well as books written by leading athletes and trainers.
- After having broad understanding of muscle building and deeply researching reasons of trainers getting injuries in a gym. A quick survey will be conducted in the RIT gym to analyze the reason for gym injuries.
- Study the technology of LED motion tracking, considering users' private information.

High fidelity prototyping and usability testing

- A high fidelity prototype will be designed based on a mind mapping, personas and user scenarios.
- Design user testing questions for the first draft of the high fidelity prototyping.
- Collect and analyze results based on feedbacks.

Visual style

A cohesive visual style will be applied in a revised prototyping.

Video compositing

- Sketch storyboard to help shooting final video.
- Compose the video with the motion prototype.

Final product

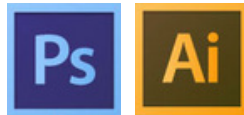
The final project will be presented in the thesis show and audiences can test the interactive prototype.

Implementation Strategies

This thesis requires a background knowledge of UI/UX design and video editing skills. Also, I have to research about the field of High-intensity interval Training in order to better understand gym injuries.

Softwares

Graphic



Documentation



Video / Motion Graphics



Prototype



Evaluation Plan

The evaluation criteria are necessary in order to improve design solutions and enhance target audiences' understanding of the Mirror Trainer. An online survey consisting of a list of research questions and face-to-face interviews with gym customers will be conducted. These will enable to collect enough valuable feedbacks.

Considerations

- Does the target audience understand the interface design and how it works?
- Does the design project achieve its objective?
- How does the gym owner think about the idea?
- Will this project provide a new insight in its fields?

Success Criteria

- The target audience can benefit from the application
- Positive feedbacks from the committee members
- Prevent injuries

Dissemination

To promote this thesis project, all of the visual elements will be posted to a major designer community, like Behance. Also, it will participate in the Imagine RIT. It will also be submitted to some design competitions, such as

HOW Interactive Design Awards

Communication Arts Interactive Competition

Adobe Design Achievement Awards

Pragmatic Considerations

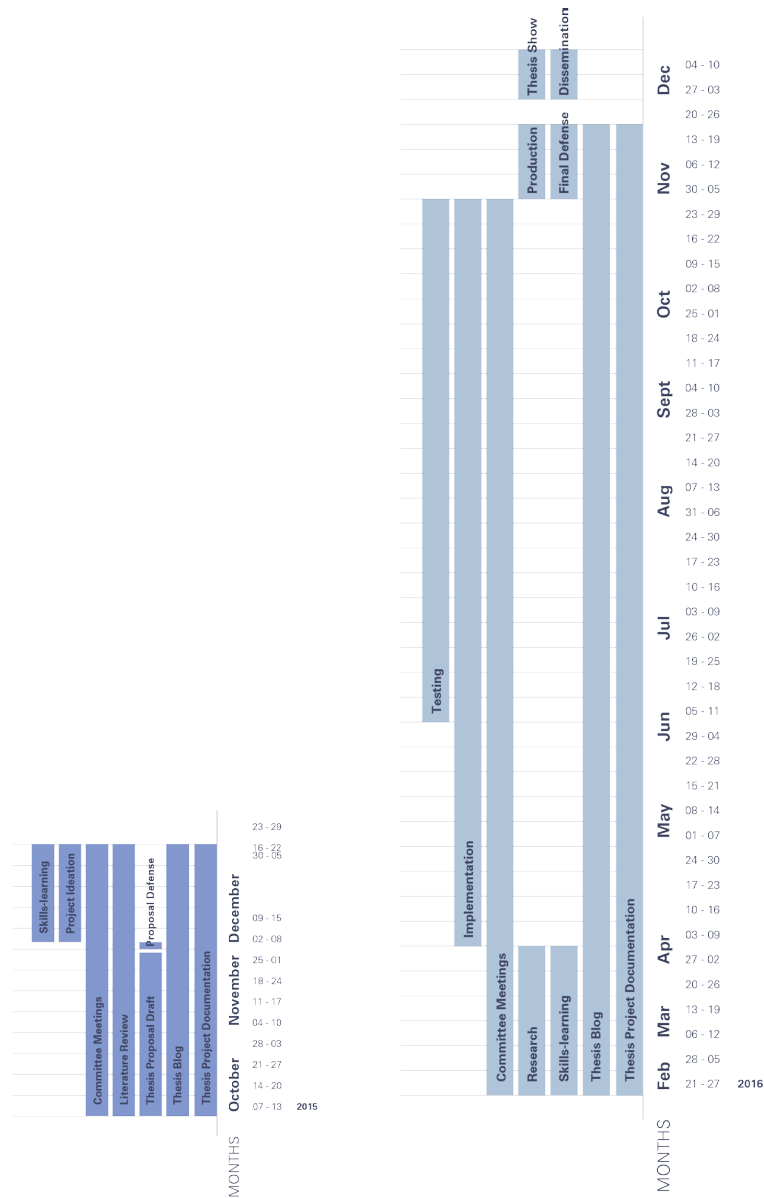
Cost for renting cameras and tool kits	\$70
Competition Entrance Fee	\$200
Thesis Website and Domains Fee	\$35

Implications

The thesis will provide a thinking on how user experience design and interface design can influence the awareness of healthy lifestyle and reduce the gym injuries.

The goal of the project is to illustrate how technology and design can be used to improve human safety in fitness field.

Timeline



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